Municipality level accessibility to specialized health care in Norway

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*** This study is a replication and extension of working paper by Kopperud. (**Kopperud G.S., 2002. *Beregning av tilgjengelighetsindeks til spesialist helsetjenester på kommunenivå.* Helseøkonomisk forskningsprogram ved UiO - Volum 2002:14. HERO skriftserie/Working paper.)

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ABSTRACT

In the Norwegian health care system equal distribution and access to care regardless of social status, gender, ethnicity and area of living has been raised as an important issue. This paper studies the extent to which the principle of "equal access" to specialized health care is maintained in the specialist health care delivery system of Norway. *Access* to specialized health care in this study is measured as a *distance weighted* form of the ratio "*per head specialized health care*" for each municipality and includes rich information on the capacity of specialist health care and the distance from residence to the hospital and private specialist care. We find inequality of access to specialist health care revealing that the capital *Oslo* has the best access to specialist health care and the residents of the northern- and easternmost county of Norway (*Finnmark county*) has the worst access. We consider this study to be helpful in identifying how equitable specialized health care are distributed and in developing future health policies.

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1. INTRODUCTION

The pursuit of equity of access to health care is a central objective of many health care systems (Goddard and Smith 2001; p. 1149). Several countries state that their aim is a health care system that ensures their citizens' universal and equitable access to good quality health care (Oliver and Mossialos, 2004). In the Norwegian health care system equal distribution and access to care regardless of differences in social status, gender, ethnicity and area of living has been raised as an important issue (Heggestad, 2009). Moreover, the Act on Health Enterprises stipulates that the main goal is to provide good and equitable specialist health care based on need and independent of age, sex, area, economy and ethnic background. However, various studies find that equal access to specialist health care is not fulfilled (Kopperud 2002) and the use of specialist health care in Norway is also determined by easy access and not solely by need (Iversen and Kopperud, 2002; Iversen and Kopperud, 2005; Nerland and Hagen, 2008).

The aim of the present study is to find out if the residents living in different municipalities in Norway have equal access to specialized health care irrespective of whether they live very close to a hospital/private specialists or whether they live in a remote area. Thus, this motivates to explore whether the policy statement of equal access in the Norwegian health care system is fulfilled. *Access* to specialized health care in this study is measured as a *distance weighted* form of the ratio "*per head specialized health care*" for each municipality and incorporates three elements: (i) the capacity of specialist health care as measured by effective hospital beds, physician man-labor years and contracted private specialists man-labor years, (ii) the distance from the municipality to be served to the municipality providing specialist health care, (iii) a discount function is introduced to place higher weights on capacity offered nearby and contrary low weights to long distanced capacity. Based on these elements we develop accessibility indices as a proxy for access.

This paper is organized as follows. In section 2 the institutional framework of the study is presented. Here we introduce the Norwegian health care system: the public and private actors, access to specialist health care and finaly access regulations. In section 3, a literature review is presented following section 4 describing the aims of the study. Section 5 describes the data the statistical method used and the results in investigating of equal access. Finally, section 7 outlines the main conclusions.

2. Norwegian health care system

In the last few decades the Norwegian health system has been going through several reforms, some radical, making use of different approaches in the financing, organizing and provision of services (Johnsen, 2006). New models for financing hospitals, the introduction of the regular GP system and the state ownership of hospitals are some of the recent reforms. Generally, the reforms have been focusing on priorities and patient rights and the responsibility of providing health care services. However, the main vision and goals of equality have been consistent over time (Johnsen, 2006).

The Norwegian health care system is organized in three levels. On the national level, the overall responsibility for the health care rests on the central government. Their main tasks along with Ministry of Health and Care Services are preparation of major reforms, guidelines, responsibility for national policy and income of the lower government levels. On the regional level, four Regional health authorities were established and given the responsibility for providing citizens with specialist health care within their region. Finally, the local level, represented by the municipalities, has responsibility for primary health care.

In 2002 the state took over ownership of hospitals, until then the county council (19 counties) was responsible for financing, planning and provision of specialized health care. This reform was made up of three strategies (Johnson, 2006). (1) The responsibility was transferred to the central government. (2) Even though the ownership is public, the hospitals are organized as enterprises meaning that they are separate legal entities and not an integral part of the central government. (3) The responsibility of everyday functioning of the enterprises lies apparently in the hands of the general manager and the executive board. Even though the state delegates the responsibility it persists in controlling the health care services through guidelines, instructions, the financing system and so forth.

The passing of responsibility to local authorities and still maintaining the principle of equity in health care is challenging for central government. However, it can be argued that despite

the central government passes on tasks, it still controls the health care services through directives, instructions, supervision and auditing (Johnsen, 2006). For example, although the responsibility for primary care is delegated to the municipalities (this includes GP scheme), the central government is in control of setting all GP's sources of income (Johnsen, 2006).

State ownership of the hospitals led to the establishments of four regional health authorities (RHAs); Northern, Central, Western and South-East Norwegian Regional Health Authority. RHAs' main task is to plan the development and organization of specialized health care according to needs of the regional population while the services are provided by the regional health authorities' health enterprises and by contracted private practices. The aim of the health enterprise is to provide high quality specialist health care on an equitable basis to patients in need, irrespective of age, sex, place of residence, financial circumstances and ethnic background (The Act on Health Enterprises). The enterprises (24 Health enterprises per January 2007) are responsible for one or several somatic hospitals each given a catchments area to provide high quality health care services according to the need of the population.

The organization of the specialist health care is often referred to as 'the health enterprise model' because it is based on a purchaser- provider division (Johnsen, 2006); RHA purchases health services while health enterprises along with contracted hospitals and private specialists provide specialists health care. About 1/3 of all somatic outpatient activity is provided by private specialists in 2008.

The Norwegian health care system is predominantly tax financed. Hospitals are financed by a mix of block grants and activity based financing. The financing of private specialists consists of a fee-for-service from the National Insurance Scheme, out-of-pocket payments and lump sum grants from the regional health authorities. The National Insurance Scheme covers all persons who either are residents, or working as employees in Norway.

2.1 Private health Care System

Although the Norwegian health care system is best described as public, regional health authorities are allowed to contract with private agencies whether it is hospitals, specialists or outpatient clinics making the private sector nearly fully embedded in the public system. Some

not-for-profit private hospitals, such as the *diaconal hospitals*, owned by the Norwegian church are financed and fully embedded as a piece of the Norwegian health care

Contracted *for-profit hospitals* are financed through activity based financing based on the DRG system and patient fees. The part of activity in private hospital that is not contracted with the regional health authority (hence, without a referral from a GP) is mainly financed by a total fee paid out of-pocket by patients. In 1990 the number of profit hospitals was modest 2 and it significantly increased to 28 by 2004. This can be explained mainly by the attractiveness and changes of the private hospitals' external environment. During period 1999-2004 the Ministry of Health had a large increase in authorization of private hospitals. The hospital reform 2002 meant a large scale contracting with private hospitals to reduce waiting times in public hospitals (Midtun, 2007). Finally, the introduction of free hospital choice reform in 2002 aimed to improve the patient's rights to choose in which hospital to receive elective treatment including contracted for- profit private hospitals and thereby granting the population equal access to high quality health care. Some of the major contracted hospitals are: Aleris hospital and medical center, Hjelp 24 NIMI AS and Volvat medical center.

Besides from private hospitals, *private contract specialists* make up the other part within the private specialized health care sector in Norway and provide different types of services. However, private specialists do not provide inpatient stay. Even though this type of outsourcing is quite small compared to the overall treatment (Askilden et al., 2007), the number of contracted private specialists accounted for 1,170 man-labor years in 2008. Many patients make use of private specialists due to services not included in public services, shorter waiting time and no referral is needed to enter for those patients willing to pay all the costs out of pocket.

The operating grant of contracted specialist health care is dependent upon various factors: the need for expensive equipment and assistant personnel, cost of premises and the size of the contract measured in man-labor years (20-100% of an estimated man-labor year) (Midtun, 2007). In addition, contracted private specialists receive reimbursement from national insurance scheme and out of pocket patient payments.

It is common for private specialists to have a part time employment in the public hospitals, also referred to as moonlighting. According to Midtun (2007) a longstanding tradition exists regarding specialists combining positions in the private and public sector and is in accordance with employee regulations. The hospital and its employed physicians are allowed to plan for overtime work within the main hospital job since exemption is made regarding regulation of forbidding planned overtime. According to the Ministry of Health and care services (2003) 50% of the private specialists are estimated to have a part time employment at a public hospital.

2.2 Access to the specialists health care

At a general level, access to health care refers to the ability to secure a specified set of services, at a specified level of quality, subject to a specified maximum level of personal inconvenience and cost, whilst in possession of a specified level of information (Goddard and Smith, 2001). Several factors can have an impact on a patient's access to health care: availability, quality, financial costs, informing patients of the possibilities of treatment, time costs, capacity and travel distance. However, measuring access is complicated and can rarely be observed directly. In this study we measure access by incorporating two elements: the capacity of hospitals and the distance from a municipality to be supplied to the municipality offering specialist health care in terms of a discount factor that converts the distance to estimated access (Iversen and Kopperud, 2002). Since our focus is accessing specialist health care, figure 1 illustrates the different ways a patient can enter the specialized health care services.

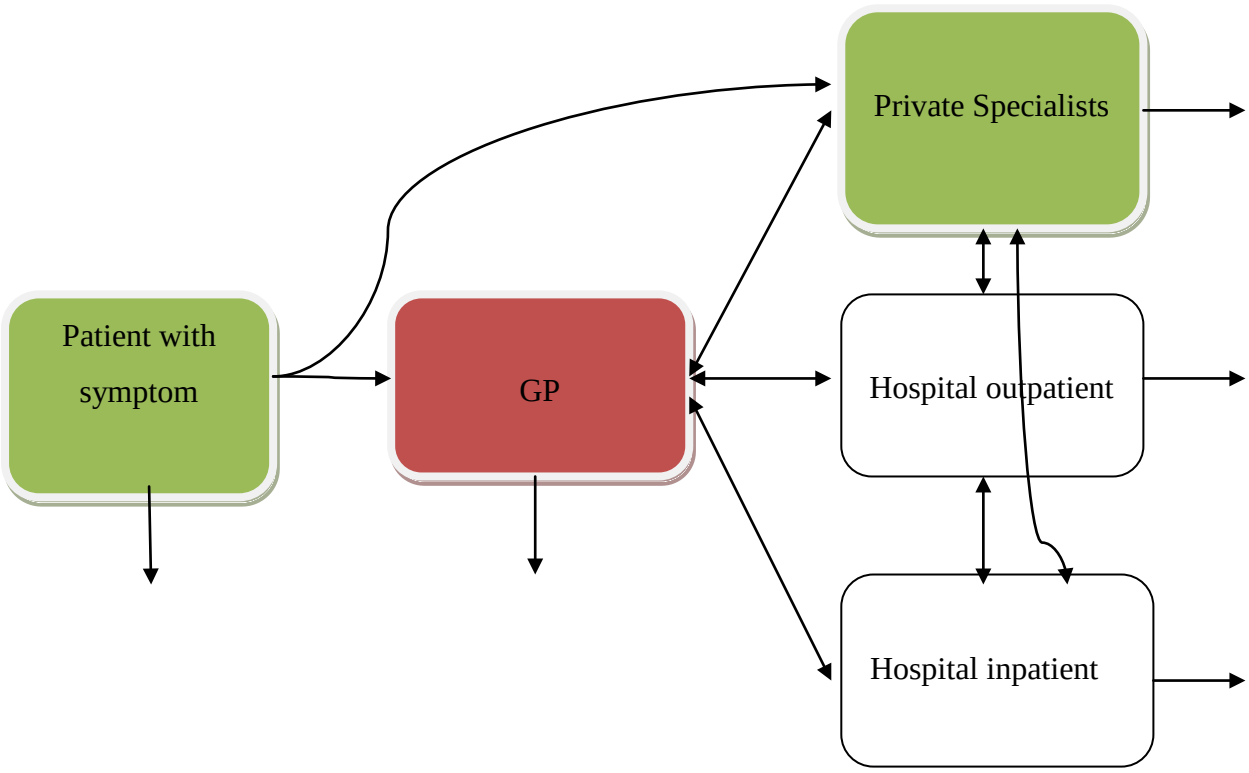

Figure 1. Non – emergency care patients flows, Iversen and Kopperud (2002) with modifications.

Figure 1 illustrates the different patient flows in a non- emergency setting. A patient with symptoms may choose not to make use of GP. This may be due to ethical consideration, preferences or religious beliefs. However, it is most likely that a patient with symptom in need for health care will visit a GP. The general practitioner may choose to treat the patients by himself or issue a referral to enter specialist health care: hospital inpatient stay, hospital outpatient visit or private specialist visit. The patients are then freely to choose where to receive treatment (The Directorate of Health, 2009), even though studies show that few patients do make use of this opportunity (Vrangbæk et al., 2007). A patient with symptoms may also contact a private specialist directly. Private specialists do not provide inpatient services.

Clearly, accessing the specialist health care is determined by the patient himself and the GP. In this relationship we assume that the patient have preferences for his own health, income and leisure (Iversen and Kopperud, 2002). GP, on the other hand, is assumed to have preferences for his patient's health and his own income (Iversen and Kopperud, 2002). It is reasonable to assume that GPs' working values and individual characteristics i.e. pushy

patients, may determine the treatment or referral for the patient to receive specialized health care. Moreover, studies show that patients of higher socio economic level communicate more actively, show more affective expressiveness and is more involved in the treatment decision (Willems S. et al., 2005). This may induce to higher referral rates among patients with high socio economic position.

A visit to a GP requires very low out of pockets copayment (132 kroner from 2009-01-07). Assuming that the patient and the GP both agree for a referral, out-of pocket payment for outpatient hospital or private specialists is 295 kroner per 2009-07-01. There are no out of pocket payments for inpatient hospital services. Patients choosing to enter the private specialists without a referral have to pay the total cost out-of pocket.

The GP is financed through grants from the municipality according to the number of patient on their list, activity based financing based on number of treatments and diagnostics and out-of-pocket payment by the patients (Brigham, 2009).

A general Norwegian health policy guideline is the LEON- principle (Lavest effektive omsorgsnivå); meaning that care should be provided at the Lowest Efficient level of care (Ministry of Health and Care Services, 2006). Thus, if justifiable, care should be provided at primary care. In this respect GPs play a meaningful role; not only do they provide primary care but they also issue referrals to elective patients before gaining access to specialist health care. Hence, they act as gatekeepers (Tjerbo, 2009). Tjerbo (2009) argues that fear of losing patients results in GP's acting more as 'advocates' rather than gatekeepers and an increase in 'unnecessary referrals'. In the next section we explore the laws and regulation that govern patient's rights to health care and access to services.

2.3 Access regulation

Although several reforms have taken place in the recent decade in the Norwegian Health care system, solidarity and equal access to care regardless of socio - economic status, sex, age and area of living has been a central goal of Norwegian health policy (Heggestad, 2009). Some

recent reforms i.e. the Norwegian Hospital Reform of 2002 also aimed at securing access to be distributed more equally (Nerland and Hagen, 2008).

There are several laws and regulations undertaken by the parliament to secure equitable access to health care. The Patients' Rights Act stipulates the rights to be a patient and its goal is '*to give population equal access to high quality health care by granting patients rights in their relations with the health service*'. The Patients Rights Act also gives the right for patient to choose where to receive treatment (The Directorate of Health; 2009) and is an option for patients with referral. The free choice of hospitals also includes private hospitals with an agreement with the regional health authorities. To help patients and health personnel to make sound decisions, an information internet site was launched, www.frittsykehusvalg.no, containing information about public and private hospitals, waiting times and quality indicators.

3. Literature review

Kopperud (2002) measures the inhabitants' access to public health care using accessibility indices. The accessibility indices include (i) the capacity of specialist health care as measured by effective hospital beds, physician man-labor years and contracted private specialist man-labor years, (ii) the distance from the municipality to be served to the municipality providing specialist health care, (iii) a function that converts distance to estimated access. She finds that access to publicly financed specialist health care is best for residents living in high population density areas. Furthermore, municipalities with the worst access are located in health region North. More specifically, these municipalities have very small number of inhabitants and are located in Nordland and Finnmark counties.

Nerland and Hagen (2008) conducted a study to find out whether the introduction of state ownership to hospitals in 2002 has lead to improved accessibility to somatic specialist health care. They find that waiting time, travel distance and primary care supply have a significant effect on use of specialist health care. The analysis of panel data demonstrates that effect of distance between an inhabitant's residence municipality and nearest hospital has increased and is negative; indicating that long traveling distance to hospitals has not resulted in the

same increase in utilization as for those living close to a hospital. A patient living in a municipality fifty kilometers away from the nearest hospital was estimated in 2001 to have on average 3 percent lower use of specialist health care compared to a patient living in a municipality offering specialized health care. For patients living in a municipality hundred kilometers away from the nearest hospital the estimated number was 6 percent lower use compared to a municipality offering hospital care. In 2005 these numbers have increased to 3.7 and 7.4 percent respectively. According to the authors, one explanation is that patients and their GP living within a municipality offering hospital services may be better informed and make more use of these services. Moreover, they also suggest that patients living far away from a hospital may choose to not make use of specialized health care due to marginal need for care.

Iversen and Kopperud (2002) study whether the Norwegian policy of distributing health care according to need is accomplished. Using data from the 1998 survey of Living Conditions by Statistics Norway and an index for accessibility of specialist health care, they find that access to hospital beds contributes negatively to a private specialist visit, while unexpectedly access to hospital physicians contributes positively to a private specialist visit. However, they find that the better the access to private specialists is, the higher is the probability of a visit to a private specialist when access to hospital physicians is disregarded.

According to Goddard and Smith (2001) geographical access has a significant effect on use of health care. Rice and Smith (2001) argue that this may due to “supplier induced demand”; meaning that individuals might be ‘induced’ to use more health services in areas with significantly high provision of health care. Contrary, people living in areas with low provision of health care may experience “supplier suppressed demand”. Goodman et al. (1997) study whether distance from the residence to the nearest hospital has an impact on hospitalization and mortality. After controlling for age, sex, bed supply, median household income, rural residence, academic medical center and presence of nursing home patients , they find that distance to hospital has an important influence on hospitalization. Residents living more than 30 minutes away from the hospital make less use of hospitalization compared to residents living in a zip code with a hospital.

We are interested in whether equal access to specialized health care irrespective of place of residence is achieved in Norway. Access incorporates three elements: (i) the capacity of specialist health care (ii) the distance from residence to the nearest hospital (iii) a distance decay effect assuming that access to specialist health care decreases with increasing travel distance to the nearest hospital.

4. Aims of the Study

The aim of the study is to find out whether the principle of *equal access* to specialized health care is fulfilled and in accordance with the Norwegian health policy. There are several laws and regulation undertaken by the parliament to secure equitable access to health care i.e. the act on health enterprises and the Patients Rights Act. However, Kopperud (2002) found that access to specialized health care varies significantly between the municipalities, using the 1998 hospital capacity data. Compared to Kopperud (2002) we use the 2007 hospital capacity data and to measure accessibility more precisely we use the hospitals catchment areas, whereas in the working paper of Kopperud (2002) a local hospital is responsible for providing specialist care to the population within its county.

5. Accessibility modeling

In this section we construct accessibility indices for the measurement of access to specialist health care. The index measures the perceived availability of specialized health care for each municipality within the four regional health authorities. The indices incorporate two elements: a measure of capacity of specialist health care and their proximity to the population of interest including a discount factor that converts the distance to estimated access. The final outcome is a number for each municipality reflecting access to specialist health care.

5.1 Capacity of Specialist Health Care

In our study the hospital capacity is measured along two- dimensions: *effective beds* and *physician man-labor years*. These data are provided by Statistics Norway covering 2007 data. *Effective beds* are defined as the average available beds during the year. *Effective beds* are calculated by dividing the total amount of day-night beds with number of days a year. In addition to this we include the size of *the contract with private specialists health care*; 20-

100% of an estimated man-labor year, which is estimated to 37.5 hours weekly work all along at least 44 weeks of the year.

Norway is very sparsely populated. The somatic hospitals differ a lot in terms of size and function. Each hospital is given a *catchment area*. The hospital is responsible for providing high quality specialist health care to the population within the catchment area. The number of patients included in each catchment area varies from 12,020 to about 401,335 inhabitants, with an average of 147,000 inhabitants per catchment area. Data on hospital catchment areas were collected through information available at their websites. An overview of all hospitals, public and non for profit hospitals with an agreement with RHA, is presented in appendix A, along with their catchment area.

The function of the 63 somatic hospitals, including specialists and non commercial hospitals, varies a lot according to its complexity. We can group the specialized health care supplied into three: supply at local level (*general-/local hospitals*), supply at regional level (*regional hospitals*) and supply at national (*tertiary care hospital*) level. A *tertiary care hospital* is defined as a university hospital with national responsibilities and treatment for patients referred from secondary care. These hospitals offer the most complex and technologically sophisticated services and because of its complexity i.e. teaching and research, specialty and expensive equipment are concentrated in few central facilities. *Regional hospitals* offer services that require more complex treatment and cannot be provided in a general- or local hospitals. A general- or a local hospital has the following minimum package of services: surgery division with acute medical treatment, internal medicine division with acute medical treatment, maternity ward and necessarily support functions within anesthesia, x-ray and laboratory services (Erikstein et al., 2006). Finally, some specialist hospitals exist. These hospitals concentrate on offering health care services of a few treatment types.

5.1.1 The Distribution of Hospital Capacity

The state ownership of hospitals from 2001 led to the establishments of five[1] health regional authorities, each responsible for the public hospitals in its region. Every region has its own regional hospital (table 1).

REGIONAL HEALTH AUTHORITY	COUNTIES INCLUDED	REGIONAL HOSPITAL
Southern and Eastern Norway	Østfold, Akershus, Oslo, Oppland og Hedmark, Vestfold, Buskerud, Telemark, Aust-Agder og Vest-Agder.	Ullevål University hospital.
Western Norway	Rogaland, Hordaland og Sogn og fjordane.	Haukeland University hospital.
Central Norway	Møre- og Romsdal, Sør-Trøndelag og Nord-Trøndelag	St. Olavs University hospital
Northern Norway	Nordland, Troms and Finnmark	North – Norway University hospital

Table 1. An overview of Regional Health Authorities, counties included and regional hospital.

The data of hospital *effective beds* and *physician man-labor years* are provided by Statistics Norway, 2007 data, and are divided by the number of population of interest to result in a ratio *per head effective beds* and *man labor years*. For most of the general- local hospitals, the number effective beds and man-labor years were captured directly from the available data and divided by the catchment area of interest. For an overview over hospitals and their catchment area see Appendix A. However, the issue becomes more complicated for a national responsibility hospital (*Rikshospitalet University Hospital*) and regional hospitals due to its construction; providing both national- and regional level treatments to its patients, and at the same time providing general- and local hospital treatments. Consequently, we use a distribution formula to allocate the activity at national, regional and local level (table 2).

[1] After the merge between Southern and Eastern health authority in 2007, today there are four health regional authorities.

	Percentage rate; the proportion of beds that is assigned to the local catchment area	Percentage rate; the proportion of beds that is assigned to region inhabitants	Percentage rate; the proportion of beds that is assigned the country
Haukeland Uni. Hos.	35.00 %	65.00 %	0.00 %
St. Olavs Hospital	35.00 %	65.00 %	0.00 %
Nord- Norge Tromsø	35.00 %	65.00 %	0.00 %
Rikshospitalet Uni. Hos.	0.00 %	20.00 %	80.00 %
Ullevål Univ. Hospital	35.00 %	65.00 %	0.00 %

	Total effective beds available for local catchment area	Total effective beds available to the region	Total effective beds available for the country
Haukeland Uni. Hos.	341.25	633.75	0
St. Olavs Hospital	307.3	570.7	0
Nord- Norge Tromsø	178.15	330.85	0
Rikshospitalet Uni. Hos	0	186.2	744.8
Ullevål Univ. Hospital	270.2	501.8	0

Table 2. The distribution of effective beds according to catchment area, region and to all inhabitants in the country using percentage estimates.

Haukeland University Hospital in Bergen had a total number of effective beds equal to 975. We assign 35 percent of its beds to its local catchment area, while the rest, 65 percent of the beds, are allocated within the region. This indicates that approximately 35 percent of its capacity is allocated to provide general-/local hospitals specialist health care treatments, while the rest is allocated to tertiary care and regional care. This capacity percentage estimates are in accordance with capacity distribution presented in NOU 1996:5 (Kopperud, 2002).

The following percentage estimates are used for distributing effective hospital beds and man-labor years in accordance with the hospital's catchment area and region inhabitants: the capacities of Haukeland University Hospital, St. Olavs hospital, University Hospital of Northern Norway and Ullevål University Hospital are distributed 65 percent to the number of inhabitants in the region and 35 percent to the number of inhabitants in the hospital's local catchment area.. Since, Rikshospitalet is the only hospital with extensive national responsibilities, 20 percent of its activity is directed to the number of inhabitants of the region while 80 percent to the number of inhabitants in the country. Table 3 shows the distribution formula used to allocate man labor years into local, regional and country level activities.

	Local catchment area	**Region**	**Country**
	Percentage rate; the proportion of man-labour years that is assigned to the local catchment area	Percentage rate; the proportion of man-labour years that is assigned to region inhabitants	Percentage rate; the proportion of man-labour years that is assigned the country
Haukland Uni. Hos.	35,00 %	65,00 %	0,00 %
St. Olavs Hospital	35,00 %	65,00 %	0,00 %
University hospital Nord-Norge Tromsø	35,00 %	65,00 %	0,00 %
Oslo university hospital Rikshospitalet	0,00 %	20,00 %	80,00 %
Oslo university hospital Ullevål	35,00 %	65,00 %	0,00 %
	Total man- labor years available to the local catchment area	Total effective beds available to the region	Total effective beds available to the country
Haukland Uni. Hos.	247,8	460,2	0
St. Olavs Hospital	208,25	386,75	0
University hospital Nord- Norge Tromsø	160,3	297,7	0
Oslo university hospital Rikshospitalet	0	150,8	603,2
Oslo univeristy hospital Ullevål	274,75	510,25	0

Table 3. The distribution of man labor years according to catchment area, region and to all inhabitants in the country using percentage estimates

There are some other difficulties when considering capacity distribution. Since we are interested in the capacity and the availability of specialist health care in each municipality, we also need to take account of the various locations of hospital divisions/premises. For example, Hospital Østfold is divided into five hospital divisions. In Halden municipality, we have *hospital Østfold division Halden*, in Sarpsborg municipality we find *hospital Østfold division Sarpsborg*, in Fredrikstad municipality we find *hospital Østfold division Fredrikstad*, in Moss municipality we have *hospital Østfold division Moss* and finally hospital Østfold in Askim. Our data include higher level capacity data i.e. Hospital Østfold and not operationalized to the five hospital divisions. Therefore we have decided upon a distribution formula to allocate the capacity to each of the hospital divisions. We have decided to weight the number of beds and man-labor years in accordance with the municipality's population:

$$b_i = \frac{number\ effective\ beds}{\sum_{i=1}^{5} Pi} * p_i \qquad m_i = \frac{number\ of\ man{-}labour\ years}{\sum_{i=1}^{5} P_i} * p_i$$

Where $b_i$the number of effective beds for each municipality, m_i is the number of man-labor years and P_i is the number of population in the municipality.

Municipal	Number of innhibitants	Percentage of the total number of inhabitants in the five municipalities	Number of beds
Askim	14740	7.48 %	37.16971942
Fredrikstad	72730	36.90 %	183.4025572
Halden	28400	14.41 %	71.61601299
Moss	29560	15.00 %	74.54117408
Sarpsborg	51660	26.21 %	130.2705363
Totalt	197090	100.00 %	

Table 4. Hospital Østfold; distribution of the number of beds at municipal level

As the table above indicates, Askim municipality will be allocated 7.48 percent of the total of beds or 37.16 beds. Fredrikstad, Halden, Moss, Sarpsborg municipalities will be distributed 183.40, 71.61, 74.54 and 130.27 number of beds respectively. Table 5 shows the distribution of man labor years in municipalities connected to Hospital Østfold.

Municipal	Number of innhibitants	Percentage of the total number of inhabitants in the five municipalities	Number of man-labour years
Askim	14740	7,48 %	25,42797707
Fredrikstad	72730	36,90 %	125,4665381
Halden	28400	14,41 %	48,99284591
Moss	29560	15,00 %	50,99396215
Sarpsborg	51660	26,21 %	89,11867675
Total	197090	100,00 %	

Table 5. Hospital Østfold; distribution of the man-labor years at municipal level

The same problem occurs with *Vestfold hospital. Vestfold hospital* has premises located in more than one municipality but available to us is the total number of beds and physician man-years at Vestfold hospital. Hence, we need a distribution formula to allocate a number of capacities to the municipalities with premises providing specialist health care. Vestfold hospital has divisions in three municipalities in Vestfold; the hospital in Tønsberg located in Tønsberg municipal, the hospital in Larvik located in Larvik municipal and finally the hospital in Sandefjord located in Sandefjord municipal.

	Percentage ratio distribution of total beds	Total available beds for each division
Hospital Vestfold division Larvik	25.00 %	106.5
Hospital Vestfold division Sandefjord	15.00 %	63.9
Hospital Vestfold division Tønsberg	60.00 %	255.6

Table 6. Vestfold Hospital; distribution of the number beds to the hospital divisions.

Here we did not allocate the hospitals capacity in accordance with the municipality's population since the hospitals located in Sandefjord and Larvik are small and has less activity compared to the hospital located in Tønsberg. Table 6 shows the assigned percentage estimates used and has been decided upon to reflect the activity level for the hospital divisions. The same percentage estimates are used when distributing the number of man-labor years to the hospital divisions. Hospital division Larvik, Sandefjord and Tønsberg is distributed (106.5), (63.9) and (255.6) beds respectively. Table 7 views the distribution of the man labor years to the three hospital divisions connected to Vestfold Hospital administrative center.

	Percentage ratio distribution of **man labor years**	Total available **man labor years** for each division
Hospital Vestfold division Larvik	25,00 %	69,5
Hospital Vestfold division Sandefjord	15,00 %	41,7
Hospital Vestfold division Tønsberg	60,00 %	166,8

Table 7. Vestfold Hospital; distribution of man labor years to the hospital divisions.

Hospital Hedmark is made up of two hospitals located in two municipalities; Elverum and Hamar municipal. Our data provide us with the total number of beds and man-labor years at Hospital Hedmark, and not allocated to each of the two divisions. The two divisions are assumed to be equal in services offered, so we divide the capacity equally between the divisions, see table 8 and 9.

	Percentage ratio distribution of total beds	Total available beds for each division
Hospital Hedmark division Elverum	50.00 %	166
Hospital Hedmark division Hamar	50.00 %	166

Table 8. The distribution of beds to Hospital Innlandet division Elverum and Hamar.

	Percentage ratio distribution of total beds	Total available of man labor years for each division
Hospital Hedmark division Elverum	50,00 %	115
Hospital Hedmark division Hamar	50,00 %	115

Table 9. The distribution of man labor years to Hospital Innlandet division Elverum and Hamar.

As the table shows we assign 166 and 115 effective beds and man labor years, respectively to hospital Hedmark division Elverum and hospital Hedmark division Hamar.

In Appendix B the capacity measured by total number of *effective beds* is displayed while Appendix C views the total number of *man-labor years* available in each hospital.

In this study we are interested in access to hospitals providing a minimum standard package of specialist health care. Therefore, hospitals that do not fulfill this requirement are excluded. We have excluded the following hospitals due to a high degree of specialization: Kysthospital in Hagevik, Haugesund rheumatism hospital, epilepsy center- SSE, Heart center in Oslo, Granheim Lung Hospital, Martina Hansen's hospital, Rheumatism hospital Lillehammer and Betanien hospital. Florø hospital is excluded because it does not offer the required minimum standard package of specialist health care.

Turning on to the capacity of contracted private specialists, these data were obtained by contacting the respective administrations of regional health authorities. The information contains the size of the contract (20-100 % of an estimated man-labor years) and the municipality where the service is provided. The numbers at municipality level were then divided by the population of the respective region, resulting in a simple ratio "man-labor years per head". Appendix D shows the contracted man-labor years at municipality level by municipality.

5.2 Geographical distance to specialists health care

A measurement of accessibility should not only incorporate the capacity of the hospitals but also its *attractiveness* as measured by the physical distance to specialist health care. It is reasonable to suggest that individuals with low travel distance to specialist health care are more opt to use specialist health care compared to individual living in rural areas. In this section we introduce a deterrence function incorporating high attractiveness to specialist health care when the distance is low. Conversely, high distance to specialist health care should result in low attractiveness.

A municipality *j* providing specialist health care at local hospital level is responsible for serving all the municipalities *i* of its catchment area, while the capacity at a regional- or national level hospital is directed to all the municipalities *i* in a region or a country, respectively. To take into account that distance reduces the perceived accessibility, we include in our model a factor$f(d_{ij})$. This factor is a distance weight from a municipality to be served *i* to the municipality where the service is provided *j* and is simply expressing the effect of distance on access. Our first assumption is that the first order derivative to be negative $f'(d_{ij}) < 0$, and the second order derivate to be positive $f''(d_{ij}) > 0$ (Iversen and Kopperud, 2002). The logic of the latter assumption is that an individual is opting to faster modes of transportation the longer distance to the 'target'. Haggett et al. (1977) suggests the following deterrence function:

$$f(c) = e^{-\beta c^{\alpha}}$$

where c is distance and β and α are parameters to be estimated.

The parameters β and α are chosen to maximize a suitable likelihood function. The chosen values are β = 0.2 and α = 0. This is in accordance with the assumptions in Carr-Hill et al. (1994). Giving higher values to β will exhibit high absolute value of the elasticity with respect to distance, contrary low values will place higher weights on long distances. The chosen decay function is then:

$$f(d_{ij}) = e^{-0.2d_{ij}},$$

The first order derivate is the negative:

$$\frac{\partial f(d_{ij})}{\partial d_{ij}} = -0.2e^{-0.2d_{ij}} < 0\ ,$$

The second order with respect to distance is then positive:

$$\frac{\partial^2 f(d_{ij})}{\partial d_{ij}} = 0.04e^{-0.2d_{ij}} > 0\ .$$

From the expressions above, the decay function is expected to decline with distance at an increasing rate. Hence, using the distance in *time* (ranging from 0- 48 hours), higher weights is placed on distance compared to distance in *km* (ranging from 0 – 2800 km). The example below, illustrates the effect of the decay function on measures of distance.

Municipality: Ullensvang. Located in western region.

Local hospital: Odda Hospital.

Regional hospital: Haukeland University hospital

National hospital: Rikshospitalet University hospital.

	Distance from Ullensvang to local, regional and national hospital respectively in ***time***, d_{ij}	$f(d_{ij}) = e^{-0.2d_{ij}}$	Distance from Ullensvang to local, regional and national hospital respectively in ***km***, d_{ij}	$f(d_{ij}) = e^{-0.2d_{ij}}$
Odda hospital	0.8	0.852144	39.7	0.000356
Haukleland unviersity Hospital	3.1	0.537944	131.5	3.78E-12
Rikshospitalet university hospital	6.61	0.266246	357.6	8.69E-32

Table 10. The effect of distance measure on the decay function.

As indicated by the table 10 above, the distance from a municipality to be served, Ullensvang, to the municipality where the service is provided, Odda, Bergen and Oslo, is 0.8 , 3.1 and 6.61 hours respectively. Or, when calculated in distance 39.7, 131.5 and 357.6 kilometer, respectively. When calculating the perceived access using *time*, the local capacity level (Odda hospital) is weighted 0.852, while using *km* the same capacity is weighted 0.000356. Thus, the distance measure in *time*, places high weights on capacity compared to distance in *km*.

The distance (d_{ij}) between the municipalities *i* and *j* is the perceived distance in *km* and journey *time* by car. InfoMap Norge AS calculated the travel distances between the 430 municipalities in Norway. To allow accurate drive-time calculation, the calculation was based on existing speed limits and possibly boat connections.

5.3 Accessibility modeling

In this section we consider the construction of a model for the measurement of the perceived accessibility to specialist health care service locations. We assume that the perceived accessibility to specialized health care is a function incorporating (i) the capacity of specialized health care in each municipality as measured by the number of effective beds, physician man-labor years and contracted private specialist man-labor years (ii) the distance from a municipality demanding specialist health care to the municipality where the services is provided (iii) a distance decay function placing lower weights to long distanced specialized health care. The final result is three *distance weighted* ratios for each municipality "*beds per head*", "*physician man-labor years per head*" and "*private specialists man-labor years per head*".

The perceived accessibility indices A_{ikr} for the residents in municipality *i* in catchment area *k* in region *r* can be described as follows (inspired by Carr-Hill et al. 1994):

$$A_{ikr} = c\left[\frac{1}{P_k}\sum_{j=1}^{n_k} S_j^{(1)}\, f(d_{ij}) + \frac{1}{P_r}\sum_{j=1}^{n_r} S_j^{(2)}\, f(d_{ij}) + \frac{1}{P}\sum_{j=1}^{430} S_j^{(3)}\, f(d_{ij})\right]$$

As mentioned earlier, the somatic hospital health services in Norway can be divided into three: supply at local level, supply at regional level and supply at national level. A local hospital in the catchment area k is providing its capacity $S_j^{(1)}$ to all the municipalities included in the catchment area. This capacity is then divided by the population of the catchment area P_k because we are interested in the relative size of the estimated supply. A regional hospital in the region r (r = 1,2,3,4), is serving its capacity to all municipalities included in the region (j=1,2,…,n_r), divided by the population of the region (P_r). Finaly, a national hospital is directing its services $S_j^{(3)}$ to the 430 exicting municipalities in Norway, divided by the Norwegian population P. The distance d_{ij} is calculated for each municipality serving specialist health care to the municipalities to be served. The decay function $f(\blacksquare)$ is included so that access is assumed to decline with distance and thereby making long distanced specialist health care less attractive. c is a constant.

The following example illustrates the use of the accessibility model (table 11) . The municipality chosen is Ullensvang and is located in the western region in Norway.

Municipality: Ullensvang. Located in western region.

Local hospital: Odda Hospital.
Regional hospital: Haukeland University hospital
National hospital: Rikshospitalet University hospital.

Capacity of specialists health care measured: Effective beds.
The number of beds local hospital: 46
The number of beds regional hospital: 975
The number of beds national hospital: 931

Distance to local hospital in km: 39.7 km.
Distance to regional hospital: 131.5 km.
Distance to national hospital: 357.6 km.

Local hospital catchment area population: 12 410
Regional population western Norway: 996 870
Population of Norway: 4 801 055

Table 11. Fact data: Ullensvang Municipality.

Before calculating the perceived accessibility for residents in Ullensvang municipality, let us first calculate the decay function $f(\blacksquare)$. In our study we assume that access declines with distance. The dictanse from Ullensvang municipality to the local, regional and national hospital is 39.7 km, 131.5 km and 357.6 km respectively. The effective beds available at the local hospital Odda are given high weights while lower weights are placed in the capacity of the national hospital. Using the decay function $f(d_{ij}) = e^{-0.2d_{ij}}$ we find:

Municipality	Distance to local hospital in *km* , d_{ij}	$f(d_{ij})$	Distance to regional hospital in *km*, d_{ij}	$f(d_{ij})$	Distance to national hospital in *km*, d_{ij}	$f(d_{ij})$
Ullensvang	39.7	3.56E-04	131.5	3.78E-12	357.6	8.69E-32

Table 12 Calculation of weight distances for Ullensvang municipality.

From table 8, the estimated *weight* on the available beds on the local hospital is 3.56E-04, for regional hospital 3.78E-12 and for national hospital 8.69E-32. Thus, the longer distance the lower weights on the capacity.

Using the fact table above, we can now calculate the perceived accessibility for the residents in Ullensvang municipality, included in Odda hospital's catchment area in, western Norway region as follows:

$$A_{ikr} = c\left[\frac{1}{P_k}\sum_{j=1}^{n_k} S_j^{(1)}\, f(d_{ij}) + \frac{1}{P_r}\sum_{j=1}^{n_r} S_j^{(2)}\, f(d_{ij}) + \frac{1}{P}\sum_{j=1}^{430} S_j^{(3)}\, f(d_{ij})\right]$$

$$= \left[\frac{1}{12\,410} 46 * 3.56E-04 + \frac{1}{996870} 975 * 3.78E-12 + \frac{1}{4801055} 931 * 8.69E-32\right]$$

= 1.32E-06

The perceived accessibility for the residents in Ullensvang municipality is 1.32E-06. Or, 1.32E-06 beds for head in Ullensvang municipality *weighted* for distance.

The perceived accessibility number calculated above for municipality Ullensvang does not tell us much. In order to make sense of the indices, the calculated accessibility is standardized. The standardized variable is normally distributed with a mean equal to 0, and standard deviation equal to 1. The following formula is used to standardize the variables:

$$X = \frac{K - \bar{k}}{\sigma_k}$$

Where X is the standardized variabel

K is calculated accessbility

$\bar{k}$ is the mean value of K

σ_k is standard deviation K

Hence, if a municipalities standardized variable exceeds 0 ($X > 0$), this implies that its perceived accessibility is higher than the average municipality. Contrary, if municipalities calculated standard variable is less than 0 ($X < 0$) its perceived accessibility to specialized

health care is less than the average municipality. The interpretation of X is how many standard deviation units an observation is above or below the mean and makes it possible to *compare* and *rank* the perceived accessibility between the municipalities. We are especially interested in the municipalities with best and worst perceived accessibility. As the figure 3 shows, about 95 % of the municipalities accessibility are expected within +/- 1.98 σ_k, and about 68% of the values are within 1 standard deviation of the mean. The standardization was made in SPSS 16.

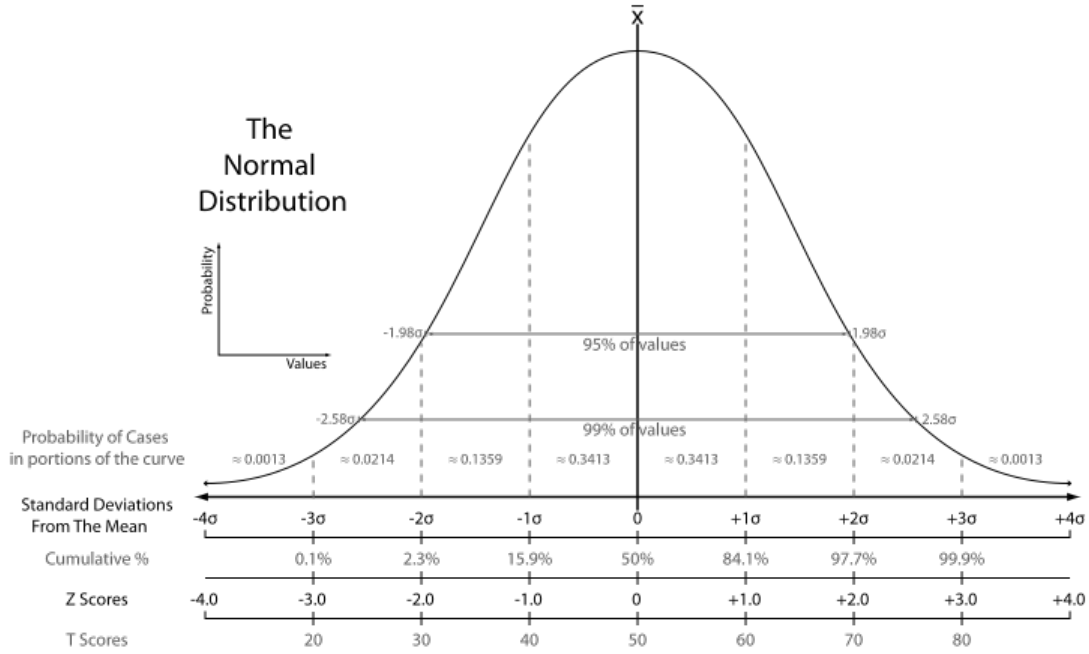

Figure 3. The Normal distribution.

5.4 Results

In this section we view the results of the municipalities' perceived accessibility as measured by *effective beds*, *physician man-labor years* and *private specialist man-labor years* weighted both in *time* and *km*. It is important to note that the distance measured in *time* and *km* differs significantly. The distance from *southernmost* city to the *northernmost* city in Norway is approximately 49 hours using the fastest mode of transportation and in kilometers approximately 2 800. This has some implications when calculating accessibility using the

decay function $f(d_{ij}) = e^{-0.2d_{ij}}$, and the following parameters β = 0.2 and α = 0. When compared to distance measured on *time*, distance in *km* places lower weights on capacity at an increasing rate, making travel distances in km a cruder measure of accessibility.

5.4.1 Hospital Effective Beds

Table 13 below shows the top 10 municipalities with best perceived accessibility in both *time* and *km*. We start by looking at the distance in time. Compared with average municipality, Oslo has the best perceived accessibility and has 9.674 standard deviations better access to specialized health care. The reason for the good accessibility in Oslo is the short distance to hospitals. Oslo provides to its residents specialist health care at local, regional and national level and with a high per head capacity. The second best perceived accessibility is Odda, located in western Norway region. The estimated accessibility in Odda is 3.2 standard deviation better access to specialized health care when compared with average municipality. Odda hospital is located in the municipality Odda and provides specialists health care to a relatively small catchment area, resulting in high number of beds per head. This is also the explanation of the high accessibility in the municipality Ullensvang.

Distance in time	
Municipality	**Standardized Index**
Oslo	9.67415
Odda	3.202775
Skien	3.077522
Porsgrunn	2.899862
Siljan	2.84827
Lillehammer	2.810098
Øyer	2.487704
Bamble	2.476048
Ullensvang	2.411492
Gausdal	2.282842

Distance in km	
Municipality	**Standardized Index**
Oslo	9.762199
Odda	5.062402
Lillehammer	4.860516
Skien	4.582924
Tinn	4.148446
Drammen	4.04216
Bergen	3.895528
Tynset	3.822325
Lærdal	3.755674
Voss	3.57091

Table 13. Top 10 municipalities with best perceived accessibility as measured by hospital effective beds.

On the top three, four and five best perceived accessibility, we find Skien, Porsgrunn and Siljan municipality respectively, located in eastern Norway, all included in Telemark county.

The high accessibility at these municipalities is due to the small catchment area for the Hospital Telemark division Skien and Hospital Telemark division Kragerø. Thus, resulting in high ratio "beds per head". The municipalities Lillehammer and Øyer score high on accessibility because they are included in a catchment area served by Hospital Hedmark Lillehammer which provides a high number of available beds.

Turning on to distance measured by *km* in table 13, comparing the tables reveals some differences. Now, included in top ten best perceived accessibilities are the municipalities Tinn, Drammen, Bergen, Tynset, Lærdal and Voss. This because distance in *km* places low weight on even small distances and as a result the top ten municipalities with best accessibility are municipalities with a hospital facility. The municipality Oslo has 9.762 standard deviations better access to specialists health care compared to the average municipality, followed by the municipalities Odda and Lillehammer.

Distance in time	
Municipality	**Standardized Index**
Berlevåg	-2.04357
Vardø	-2.02037
Hasvik	-1.97211
Lebesby	-1.96978
Båtsfjord	-1.9494
Gamvik	-1.94126
Guovdageaidnu Kautokeino	-1.76995
Vadsø	-1.76191
Loppa	-1.73824
Kvænangen	-1.69495

Distance in km	
Municipality	**Standardized Index**
Lebesby	-0.32794
Gamvik	-0.32794
Guovdageaidnu Kautokeino	-0.32794
Berlevåg	-0.32794
Loppa	-0.32794
Vardø	-0.32794
Hasvik	-0.32794
Båtsfjord	-0.32794
Karasjok	-0.32794
Steigen	-0.32794

Table 14. The bottom 10 municipalities with worst perceived accessibility as measured by hospital effective beds.

The municipalities with the worst access to specialized health care as measured by effective beds in our model are (distance in *time*): Berlevåg (-2.04) , Vardø (-2.02), Hasvik (-1.97) and Lebesby (-1.969). One characteristic of these municipalities are their location in Northern Norway, and in Finnmark county. Berlevåg has an access to specialized care that is -2.04 standard deviations lower than the average accessibility in Norway. The reason for this is the

long travel distance and "beds per head" provided. The municipalities[2] Lebesby, Gamvik and Kautokeino are observed with the worst access to effective beds when measured in km (table 14). All the ten municipalities listed above are located in the Finnmark county, is the northern- and easternmost county of Norway, except of Kvænangen and Steigen municipalities.

5.4.2 Physician man-labor years

The municipality with best perceived accessibility as measured by physician man-labor and distance in time is Oslo followed by Lillehammer, Øyer and Gausdal all these located in eastern Norway region (table 15). Oslo has a perceived accessibility that is 11.77 standard deviation units higher than the average accessibility in Norway. Again, this is due to hospital capacity in the capital Oslo, providing high capacity services at local, regional and national level. Hospital Innlandet division Lillehammer provides specialist health care at local level to the municipalities Lillehammer, Øyer and Gausdal. The reason for the high accessibility in these municipalities are (1) the high capacity of physician man-labor years and (2) the short distance between Øyer and Lillehammer (*0.3 hours*) and Gausdal to Lillehammer (*0.5 hours*). Compared to the municipality with average accessibility, Drammen (located just outside Oslo) has 2.13 standard deviations higher accessibility.

Distance in time	
Municipality	**Standardized Index**
Oslo	11.775561
Lillehammer	2.877092
Øyer	2.551674
Gausdal	2.344695
Drammen	2.139415
Lier	2.012067
Ringebu	1.904666
Nedre Eiker	1.881502
Røyken	1.832279
Hamar	1.806286

Distance in km	
Municipality	**Standardized Index**
Oslo	11.871946
Lillehammer	5.084567
Drammen	4.035801
Bergen	3.984476
Skien	3.607238
Haugesund	3.465427
Tromsø	3.456263
Bodø	3.291367
Ålesund	3.282304
Lørenskog	3.166904

Table 15. The top 10 municipalities with best perceived accessibility as measured by physician man-labor years.

[2] The standardization of the accessbility indices is done in SPSS. Since, the calculation of accessiblity indices in *km* contains a very large number of decimals and the number of decimals in SPSS is limited to 16, the result of the standardization for the first ten municipalities with the worst access are equal with respect to the first 16 decimals.

Turning on to the results weighted in distance *km*, we still have Oslo as the municipality with the best accessibility to specialist health care, followed by Lillehammer, Drammen, Bergen and Skien. Oslo has 11.87 standard deviations higher accessibility hospital physician man-labor years when compared to the average municipality. Furthermore, using the distance *km*, has as indicated, resulted in low weights being placed on capacity on even the smaller distances. Thus, municipality where the service is provided experiences the best perceived accessibility. In Drammen, Bergen, Skien, Haugesund and Tromsø we find Buskerud Hospital, Haukeland University Hospital, Telemark Hospital division Skien, Haugesund Hospital respectively.

Distance in time	
Municipality	**Standardized Index**
Berlevåg	-2.09173
Vardø	-2.07065
Lebesby	-2.01937
Båtsfjord	-2.00342
Gamvik	-1.99267
Hasvik	-1.9651
Vadsø	-1.82862
Guovdageaidnu Kautokeino	-1.79077
Røst	-1.75977
Loppa	-1.68944

Distance in km	
Municipality	**Standardized Index**
Lebesby	-0.316572
Gamvik	-0.316572
Guovdageaidnu Kautokeino	-0.316572
Berlevåg	-0.316572
Loppa	-0.316572
Vardø	-0.316572
Hasvik	-0.316572
Båtsfjord	-0.316572
Karasjok	-0.316572
Steigen	-0.316572

Table 16. The bottom 10 municipalities with worst perceived accessibility as measured by physician man-labor years.

Municipalities Berlevåg, Vardø, Lebesby and Båtsfjord have the lowest perceived accessibility when using the index in time. The index is respectively -2.09, -2.07, -2.02, -2. Again, these municipalities are located in the Northern part of Norway, in Finnmark County. Båtsfjord has a perceived accessibility to health care that is 2.07 standard deviation lower than the average accessibility. The reason for the low accessibility for the residents in Northern Norway is due to the long distance to hospital care. Hospital care in Finnmark County is provided by Kirkenes Hospital and Hammerfest Hospital. The distances from municipalities Berlevåg, Vardø and Lebesby to Kirkenes Hospital are 5.43, 4.98 and 6.85 *hours* respectively, and to *Hammerfest Hospital* 10.02, 10.26 and 7.71 *hours* respectively. Regarding access to

specialized health care as measured by physician man labor years in km we see that Lebesby, Gamvik and Kautokeino are at the bottom of the list of worst access.

5.4.3 Private Specialist Health Care

Turning on to the last accessibility index, capacity of contracted private specialists, the raw data were obtained by contacting the administrations of the respective regional health authorities. The information contains the size of the contract (20-100 % of an estimated man-labor years) and the municipality where the service is provided (see appendix c). The data at municipality level were then divided by the population at the respective region, indicating that the contracted private specialists are available for the whole region. Finally, we adjust for distance, resulting in a distance weighted form of the simple ratio "man-labor years per head". In total there are 774 man-labor years contracted private specialists. As much as 26 percent of them are located in Oslo.

The municipality with the best perceived accessibility to contracted private health care is Oslo as measured by distance both in *time* and *km* (Table 17). This is because South-Eastern Regional Health Authority has approx. 200 man-labor years contracts with private specialists located in Oslo. Interestingly, when distance is measured in *time*, the remaining of the ten best perceived accessibility municipalities are located in eastern of Norway and neighbor/bordering municipalities and with very short distance to make use of the capacity in Oslo. Again, however, when using the distance in *km*, the results become unreasonable because now the capacity in Oslo is weighted low even for small distance neighbor municipalities.

Distance in time	
Municipality	**Standardized Index**
Oslo	2.210394
Bærum	2.122598
Asker	2.108632
Oppegård	2.062795
Lørenskog	2.048875
Skedsmo	2.006078
Nittedal	1.984661
Lier	1.984128
Rælingen	1.977956
Drammen	1.968217

Distance in km	
Municipality	**Standardized Index**
Oslo	13.168939
Bergen	8.107699
Trondheim	8.10536
Tromsø	5.208638
Bodø	4.920448
Stavanger	3.324142
Bærum	3.096208
Os	2.362468
Haugesund	2.020955
Levanger	1.756921

Table 17. Top 10 municipalities with best perceived accessibility as measured by contracted specialists health care.

High population density areas such as Bergen, Trondheim and Tromsø rank high on accessibility indices. The index is respectively 8.11, 8.10 and 5.2 standard deviations better access to private specialists than the average municipality. The municipalities with the worst perceived access are Vardø, Sør-Varanger, Berlevåg, Båtsfjord and Vadsø. The accessibility index is respectively -1.53, -1.53, -1.53, -1.52, -1.51. The calculated accessibility in Vardø is 1.53 standard deviations lower than the average municipality.

Distance in time	
Municipality	**Standardized Index**
Vardø	-1.53817
Sør-Varanger	-1.53491
Berlevåg	-1.53443
Båtsfjord	-1.52499
Vadsø	-1.51431
Lebesby	-1.50265
Gamvik	-1.49975
Unjárga Nesseby	-1.49604
Deatnu Tana	-1.48336
Bindal	-1.45596

Distance in km	
Municipality	**Standardized Index**
Vardø	-0.247823
Sør-Varanger	-0.247823
Berlevåg	-0.247823
Båtsfjord	-0.247823
Vardsø	-0.247823
Lebesby	-0.247823
Gamvik	-0.247823
Unjárga Nesseby	-0.247823
Deatnu Tana	-0.247823
Berg	-0.247823

Table 18. The bottom 10 municipalities with worse perceived accessibility as measured by contracted specialists health care.

Table 18, shows that municipalities Vardø, Sør-Varanger and Berlevåg has the lowest perceived accessibility when using the index in time. Furthermore, all the ten municipalities listed above are located in Northern Norway. This is not just due to the long distance to contracted private specialists but also due to the low capacity provided. The residence of South- Eastern part of Norway, the region with the highest number of contracted private specialist care, has a capacity *2.55 E-04* per head, while the residence of Northern Norway has *9.43 E-05* per head. Turning on to the index in km we see that Vardø, Sør-Varanger and Berlevåg have the worst access to contracted man labor years.

6. Conclusion

The aim of this study is to find out whether the residents living in different municipalities in Norway have equal access to specialized health care irrespective of whether they live very close to a hospital/private specialist or whether they live in a remote area. We construct accessibility indices to be used as a proxy for *access* to specialists health care. The accessibility indices incorporate three elements: (i) the capacity of specialists health care as measured by effective hospital beds, physician man-labor years and contracted private specialists, (ii) the distance from the municipality to be served to the municipality providing specialists health care, (iii) a discount function is introduced to place higher weights on capacity offered nearby and contrary low weights to long distanced capacity. The final result is three distance weighted ratios for each of the 430 municipalities: "*effective hospital beds per head*" , "*physician man-labor years per head*" and "*private specialists man-labor years per head*" (See appendix E – J).

Distance from the municipality to be supplied to the municipality providing specialist health care is measured both in *time* and *km*. The discount function $f(d_{ij}) = e^{-0.2d_{ij}}$, and the parameters used in this study, β = 0.2 and α = 0 are equal to the assumption made by Carr-Hill et al. (1994). This implies that when compared to distance measured in *time*, distance in *km* places lower weights on capacity at an increasing rate. Hence, this disparity is presumably because travel distance in km, is a cruder measure of accessibility as compared to travel time (Nair S et al. 2009). However, independent of distance measure used, the results indicate that the capital *Oslo* has the best perceived accessibility to specialist health care and the municipalities located in Northern Norway, more specifically Finnmark County has the worst perceived accessibility.

Iversen and Kopperud (2002) argue that because Norway is one of the most sparsely populated countries in Europe (15 persons per km^2) 'equal access' is hardly attainable since it implies that all inhabitants should have the same traveling distance to specialist health care. This study supports this conclusion.

It should now be clear that access to specialized health care depends on where you live. Our results reveal important variations in access to specialist health care which gives rise to ethical

concerns. The residence in Oslo has the best perceived accessibility while the lowest perceived accessibility is estimated in municipalities in northern- and easternmost county of Norway: Finnmark County. Finally, we consider this study to be helpful in identifying how fairly and just specialized health care is distributed and in developing future health policies.

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8. Appendix

Appendix A: An overview of regional health authority, hospitals and catchment area.

Regional Health Authority	Hospital	Catchment area Municipalities	Residence in the catchment area
Central Norway			
	Helse Sunnmøre HF Volda Sjukehus	Giske, Haram, Hareid, Herøy, Norddal, Sande, Skodje, Stordal, Stranda, Sula, Sykkylven, Ulstein, Vanylven, Volda, Ørskog, Ørsta and Ålesund.	131 450
	Helse Sunnmøre HF Ålesund sjukehus	Giske, Haram, Hareid, Herøy, Norddal, Sande, Skodje, Stordal, Stranda, Sula, Sykkylven, Ulstein, Vanylven, Volda, Ørskog, Ørsta and Ålesund.	131 450
	Helse Nordmøre and Romsdal Kristiansund sykehus	Aukra, Fræna, Midsund, Molde, Nesset, Sandøy, Rauma, Vestnes, Aure, Averøy, Eide, Frei, Gjemnes, Halsa, Kristiansund, Rindal, Smøla, Sunndal, Surnadal and Tingvoll.	117 130
	Helse Nordmøre and Romsdal Molde sjukehus	Aukra, Fræna, Midsund, Molde, Nesset, Sandøy, Rauma, Vestnes, Aure, Averøy, Eide, Frei, Gjemnes, Halsa, Kristiansund, Rindal, Smøla, Sunndal, Surnadal and Tingvoll.	117 130
	St. Olavs sykehus. (Local level)	Sør- Trøndelag county with the exception of these municipalities: Nordland, Osen, Tydal and half of Malvik.	286 860
	St. Olavs sykehus (region level).	Central Norway region	666 270
	St. Olavs sykehus Orkdal Sjukehus	Sør- Trøndelag county with the exception of these municipalities: Nordland, Osen, Tydal and half of Malvik.	286 860
	St. Olavs hospital Røros	Sør- Trøndelag county with the exception of these municipalities: Nordland, Osen, Tydal and half of Malvik.	286 860

Regional Health Authority	Hospital	Catchment area Municipalities	Residence in the catchment area
Central Norway			
	Helse Nord- Trøndelag :Sykehuset Levanger	Nord- Trøndelag county including Bindal in Nordland og Osen, Selbu, Tydal og half of Malvik in Sør- Trøndelag	149 175
	Helse Nord- Trøndelag: Sykehuset Namsos	Nord- Trøndelag county including Bindal in Nordland og Osen, Selbu, Tydal og half of Malvik in Sør- Trøndelag	149 175

Regional Health Authority	Hospital	Catchment area municipalities	Residence in the catchment area
Northern Norway			
	Helgelandssykehuset Mo i Rana	Bindal, Sømma, Brønnøy, Vega, Vevelstad, Herøy, Alstadhaug, Leirfjord, Vefsn, Grane, Hattfjelldal, Dønna, Nesna, Hemnes, Rana, Lurøy, Træna, Rødøy.	76 920
	Helgelandssykehuset Mosjøen	Bindal, Sømma, Brønnøy, Vega, Vevelstad, Herøy, Alstadhaug, Leirfjord, Vefsn, Grane, Hattfjelldal, Dønna, Nesna, Hemnes, Rana, Lurøy, Træna, Rødøy.	76 920
	Helgelandssykehuset Sandnessjøen	Bindal, Sømma, Brønnøy, Vega, Vevelstad, Herøy, Alstadhaug, Leirfjord, Vefsn, Grane, Hattfjelldal, Dønna, Nesna, Hemnes, Rana, Lurøy, Træna, Rødøy.	76 920
	Helse Finnmark Klinikk Hammerfest	Finnmark county	72 435
	Helse Finnmark Klinikk Kirkenes	Finnmark county	72 435
	Longyearbyen Sykehus	Troms county including Narvik, Tysfjord, Lødingen, Tjeldslund, Evenes and Ballangen	183 635
	Nordlanssykehuset Bodø	Bodø, Meløy, Gildeskål, Beiarn, Saltdal, Fauske, Sørfold, Steigen, Hamarøy, Tysfjord- Vest for Tysfjorden, Røst, Værøy, Flakstad, Vestvågøy, Vågan, Moskenes, Hadsel, Bø, Øksnes, Sortland and Andøy	132 500
	Nordlandssykehuset Lofoten	Bodø, Meløy, Gildeskål, Beiarn, Saltdal, Fauske, Sørfold, Steigen, Hamarøy, Tysfjord- Vest for Tysfjorden, Røst, Værøy, Flakstad, Vestvågøy, Vågan, Moskenes, Hadsel, Bø, Øksnes, Sortland and Andøy	132 500

Regional Health Authority	Hospital	Catchment area municipalities	Residence in the catchment area
Northern Norway			
	Nordlandssykehuset Stokmarknes	Bodø, Meløy, Gildeskål, Beiarn, Saltdal, Fauske, Sørfold, Steigen, Hamarøy, Tysfjord- Vest for Tysfjorden, Røst, Værøy, Flakstad, Vestvågøy, Vågan, Moskenes, Hadsel, Bø, Øksnes, Sortland and Andøy	132500
	Universitetssykehuset Nord-Norge Harstad	Troms county including Narvik, Tysfjord, Lødingen, Tjeldslund, Evenes and Ballangen	183 635
	Universitetssykehuset Nord-Norge Narvik	Troms county including Narvik, Tysfjord, Lødingen, Tjeldslund, Evenes and Ballangen	183 635
	Universitetssykehuset Nord-land Tromsø. Local level.	Troms county including Narvik, Tysfjord, Lødingen, Tjeldslund, Evenes and Ballangen	183 635
	Universitetssykehuset Nord-Norge Trømsø. Region level.	Northern Norway region	463 450

Regional Health Authority	Hospital	Catchment area municipalities	Residence in the catchment area
Western Norway			
	Florø sjukehus	Not included. The hospital has focus on tasks of border between primary care and specialist health care. The hospials inpatient stay department is closed.	
	Førde sentralsjukehus	Flora, Gulen, Soulnd, hyllestad, Høyanger, Vik, Årdal, Askvoll, Fjaler, Gaular, Jølster, Førde and Naustdal.	106 485
	Helse Bergen HF. Local level.	Fedje, Øygarden, Fjell, Sund, Austevoll, Austheim, Radøy, Meland, Askøy, Bergen, Os, Masfjorden, Lindas, Osterøy, Samnanger, Fusa, Modalen, Vaksdal, Kvam, Voss , Granvin and Ulvik.	401 335
	Helse Bergen HF. Region level.	Western Norway region.	996 870
	Helse Fonna HF Haugesund sjukehus	The following municipalitites: Bokn, Haugesund, Karmøy, Tysvær, Utsira, Vindafjord, Etne, Sveio, Sauda and Suldal.	109 285

Regional Health Authority	Hospital	Catchment area municipalities	Residence in the catchment area
Western Norway			
	Helse Fonna HF Odda sjukehus	Odda, Ullensvang, Eidfjord and Jondal	12 410
	Helse Fonna HF Sauda	Not included. Department Sauda is organized under Haugesund Hospital, surgical clinic. Offers daytreatment in surgery and urology.	
	Helse Fonna HF Stord sjukehus	Stord, Bømlo, Fitjar, Tysnes and Kvinnherad.	47 215
	Helse stavanger HF	South of Rogaland county: Søkndal, Lund, Eigersund, Bjerkreim, Hå, Time, Gjesdal, Klepp, Sandnes, Forsand, Stavanger, Sola, Randaberg Strandm Kvitsøy, Rennesøy, Hjelmeland and Finnøy.	320 140
	Kysthospitalet i Hagevik	Not included due to high degree of specialization.	
	Lærdal sjukehus	Indre Sogn: Aurland, Balestrand, Leikanger, Luster, Lærdal, Sogndal, Vik and Årdal.	19 230
	Nordfjord Sjukehus	The following municipalitites: Stryn, Hornindal, Eid, Gloppen, Vågsøy, Selje and parts of Bremanger.	32 360
	Voss Sjukehus	Kvam, Granvin, Ulvik, Voss, Vaksdal and Modalen.	28 720
	Haraldsplass Diakonale Sykehus	Borough: Bergenhus, Åsane og Arna i Bergen.Municipalities: Lindås, Meland, Radøy, Austrheim, Fedje, Masfjorden, Samnanger and Osterøy.	123 391
	Haugesund sanitetsforeningsrevmatisme sykehus	Not included in the study due to high degree of specialization. Provides services within skin diseases and rheumatism.	

Regional Health Authority	Hospital	Catchment area muncipalities	Residence in the catchment area
Southern and Eastern Norway			
	Sykehuset Asker og Bærum	Asker og Bærum	163 580
	Sykehuset buskerud	Drammen, Nedre Eiker, Lier, Røyken and Hurum.	134 440
	Sykehuset i Vestfold Larvik	Vestfold county	229 280
	Sykehuset i vestfold Sandefjord	Vestfold county	229 280
	Sykehuset i vestfold i Tønsberg	Vestfold county	229 280

Regional Health Authority	Hospital	Catchment area muncipalities	Residence in the catchment area
Southern and Eastern Norway			
	Sykehuset innlandet Elverum	Engerdal, Trysil, Åmot, Ringsaker, Hamar, Løten, Elverum, Stange, Våler and Åsnes.	130 510
	Sykehuset innlandet Hamar	Engerdal, Trysil, Åmot, Ringsaker, Hamar, Løten, Elverum, Stange, Våler and Åsnes.	130 510
	Sykehuset innlandet Gjøvik	Vang, Vestre Slidre, Nord Aurdal, Sør- Aurdal, Øystre slidre, Etnedal, Nordre land, Gjøvik, Vestre toten, Østre Toten, Sørdre Land, Gran, Jevnaker and Lunner.	114 325
	Sykehus innlandet divisjon kongsvinger	Nord Odalm Grue, Sør- Odal, Eidskog, kongsvinger and Nes in Akershus county.	60 355
	Sykehus innlandet Divisjon Lillehammer	Lesja, Skjåk, Lom, Dovre, vågå, Nord- fon, Sel, Sør-fon, ringebu, Øyer, Gausdal and lillehammer.	70 070
	Sykehus innlandet divisjon Tynset	Os, Tolga, Tynset, folldal, Alvdal, Rendalen and Stor-Elvdal	17 870
	Sykehus innlandet Granheim Lungesykehuset	Not included in the study due to high degree of specialization.	
	Sykehuset Telemark Skien	Porsgrunn, Skien, Siljan, Bamble, Kragerø. Drangedal, Nissedal og Fyresdal.	119 930
	Sykehuset Telemark Kragerø sykehus	Porsgrunn, Skien, Siljan, Bamble, Kragerø. Drangedal, Nissedal and Fyresdal.	119 930
	Sykehuset Østfold avd. Askim	Østfold county.	267 915
	Sykehuset Østfold avd. Fredrikstad	Østfold county.	267 915
	Sykehuset Østfold avd. Halden	Østfold county.	267 915
	Sykehuset Østfold avd. Moss	Østfold county.	267 915
	Sykehuset Østfold avd. Sarpsborg	Østfold county.	267 915
	Sørlandet sykehus HF Arendal	Aust-Agder county	107 430
	Sørlandet sykehus HF Flekkefjord	Vest-Agder county	168 225

Regional Health Authority	Hospital	Catchment area muncipalities	Residence in the catchment area
Southern and Eastern Norway			
	Sørlandet sykehus HF kristiansand	Vest-Agder county	168 225
	Diakonhjemmet sykehus	The following boroughs in Oslo: Vestre Aker, Ullern and Frogner.	121 653
	Martina Hansens hospital	Not included in the study due to high degree of specialization.	---------
	Revmatisme sykehuset Lillehammer	Not included in the study due to high degree of specialization.	---------
	Betanien hospital	Not included in the study due to high degree of specialization.	---------
	Spesialsykehuset for rehabilitering Stavern	Not included in the study due to high degree of specialization.	---------

Regional Health Authority	Hospital	Catchment area muncipalities	Residence in the catchment area
Southern and Eastern Norway			
	Akershus universitetssykehus	Gjerdrum, Ullensaker, Nannestad, Eidsvoll, Nes, Hurdal, Aurskog-Høland, Enebakk, Fet, Lørenskog, Nittedal, Rælingen, Sørum og Skedsmo. Samt kommunene Rømskog og Enebakk. Bydeler i Oslo: Grorud and Stovner.	288 271
	Blefjell sykehus kongsberg	Kongsberg, Nore og Uvdal, Sigdal, Rollag, Flesberg and Øvre Eiker.	50765
	Blefjell sykehus Notodden	Bø, Hjartdal, Nome, Notodden, Kviteseid, Sauherad and Seljord.	35735
	Blefjell sykehus Rjukan	Tinn, Tokke and Vinje.	12020
	Epilepsisenteret - SSE	Not included in the study due to high degree of specialization.	
	Hjertesenteret i Oslo	Not included in the study due to high degree of specialization.	
	Lovisenberg Diakonale sykehus AS	The following boroughs in Oslo: St. Hanhaugen, Grunerløkka, Sagene and Gamle Oslo.	150 594
	Oslo Universitetssykehus Aker	The following boroughs in Oslo : Bjerke and Alna. Municipalities: Ski, Oppegård, Nesodden, Ås, Frogn and Vestby.	159 829
	Oslo Universitetssykehus Rikshospitalet. Local level.	The following boroughs in Oslo Frogner, Ullern og vestre Aker.	121 653
	Oslo Universitetssykehus Rikshospitalet. National responsibility.	National responsibility.	4 801 055

Regional Health Authority	Hospital	Catchment area muncipalities	Residence in the catchment area
Southern and Eastern Norway			
	Oslo universitetssykehus Ullevål fylkesfunksjon	The following boroughs in Oslo : Sagene, Nordre Aker, Østensjø, Norstrand and Søndre Norstrand.	171 034
	Oslo Universitetssykehus Ullevål Regionfunksjon	SouthEastern region.	3 671 335
	Ringerike sykehus	Ringerike, Hole, Flå, Gol, Hemsedal, Ål, Hol, Krødsherad and Modum.	66150
	Stensby sykehus	Nannenstad, Hurdal, Eidsvoll, Ullensaker and Nes.	80505
	Sunnaas sykehus	Not included in the study due to high degree of specialization. .	

Appendix B: Hospital effective beds 2007 data

	Effective beds
TOTAL NUMBER OF EFFECTIVE BEDS	13553
Healthregion Sothern and Eastern Norway TOTAL Effective beds	7382
Aker universitetssykehus	343
Akershus Universitetssykehus	496
Bærum sykehus	254
Diakonhjemmet sykehus	188
Granheim lungesenter	40
Kongsvinger sjukehus	124
Lovisenberg diakonale sykehus	181
Martina Hansens hospital	75
Oppland sentralsykehus, avd. Gjøvik	201
Oppland sentralsykehus, avd. Lillehammer	250
Revmatismesykehuset AS	48
Sentralsjukehuset i Hedmark	332
Ski sykehus	0
Stensby sykehus	68
Sunnaas sykehus	148
Sykehuset Innlandet Tynset	51
Sykehuset Østfold	497
Ullevål universitetssykehus	772
Betanien Hospital	52
Det Norske Radiumhospital	0
Hjertesenteret i Oslo	0
Kongsberg sykehus	103
Kongsgård sykehus	0
Kragerø sykehus	51
Notodden sykehus	51
Rikshospitalet – Radiumhospitalet	931
Ringerike sykehus	144
Rjukan sykehus	37
Spesialsykehuset for epilepsy	0
Spesialsykehuset for rehabilitering Stavern	110
Sykehuset Buskerud	404
Sykehuset i Vestfold	426
Sykehuset Telemark	405
Sørlandet sykehus Arendal	240
Sørlandet sykehus Flekkefjord	65
Sørlandet sykehus Kristiansand	188
Healthregion Western Norway TOTAL effective beds	2552
Førde sentralsjukehus	188
Haraldsplass Diakonale Sykehus AS	175
Haugesund sanitetsforenings revmatisme sykehus	44
Haugesund sjukehus	223
Haukeland universitetssjukehus	975
Lærdal sjukehus	54

Nordfjord sjukehus	53
Odda sjukehus	46
Stavanger universitetssjukehus	634
Stord sjukehus	83
Voss sjukehus	77
Healthregion Central Norway TOTAL effective beds	1834
Kristiansund sykehus	101
Molde sjukehus	178
Orkdal sjukehus	0
St Olavs Hospital	878
Sykehuset Levanger	203
Sykehuset Namsos	107
Volda sjukehus	67
Ålesund sjukehus	300
Healthregion Northern Norway Total effective beds	1539
Hammerfest sykehus	102
Harstad sykehus	103
Helgelandssykehuset Mo i Rana	95
Helgelandssykehuset Mosjøen	33
Helgelandssykehuset Sandnessjøen	78
Kirkenes sykehus	61
Longearbyen sykehus	7
Narvik sykehus	71
Nordlandssykehuset Lofoten	52
Nordlandssykehuset Sentrum	340
Nordlandssykehuset Vesterålen	88
Stokmarknes sykehus	0
Universitetssykehuset i Nord-Norge	509

Appendix C: Physician man labor years 2007 data

	Physician Man-labor years
TOTAL NUMBER OF PHYSICIAN MAN-LABOR YEARS:	8640
Healthregion Southern and Eastern Norway TOTAL Man-Labor years	4765
Aker universitetssykehus	238
Akershus Universitetssykehus	400
Bærum sykehus	139
Diakonhjemmet sykehus	107
Granheim lungesenter	4
Kongsvinger sjukehus	54
Lovisenberg diakonale sykehus	76
Martina Hansens hospital	33
Oppland sentralsykehus, avd. Gjøvik	121
Oppland sentralsykehus, avd. Lillehammer	152
Revmatismesykehuset AS	14
Sentralsjukehuset i Hedmark	230
Ski sykehus	0
Stensby sykehus	14
Sunnaas sykehus	32
Sykehuset Innlandet Tynset	24
Sykehuset Østfold	340
Ullevål universitetssykehus	785
Betanien Hospital	18
Det Norske Radiumhospital	0
Hjertesenteret i Oslo	0
Kongsberg sykehus	50
Kongsgård sykehus	0
Kragerø sykehus	6
Notodden sykehus	23
Rikshospitalet – Radiumhospitalet	754
Ringerike sykehus	71
Rjukan sykehus	9
Spesialsykehuset for epilepsy	0
Spesialsykehuset for rehabilitering Stavern	23
Sykehuset Buskerud	235
Sykehuset i Vestfold	278
Sykehuset Telemark	189
Sørlandet sykehus Arendal	118
Sørlandet sykehus Flekkefjord	26
Sørlandet sykehus Kristiansand	203
Healthregion Western Norway TOTAL Man-Labor years	1616
Førde sentralsjukehus	151
Haraldsplass Diakonale Sykehus AS	80
Haugesund sanitetsforenings revmatisme sykehus	16
Haugesund sjukehus	166
Haukeland universitetssjukehus	708
Lærdal sjukehus	0
Nordfjord sjukehus	0
Odda sjukehus	17

Stavanger universitetssjukehus	411
Stord sjukehus	39
Voss sjukehus	30
Healthregion Central Norway TOTAL Man-Labor years	1157
Kristiansund sykehus	59
Molde sjukehus	108
Orkdal sjukehus	0
St Olavs Hospital	595
Sykehuset Levanger	111
Sykehuset Namsos	57
Volda sjukehus	37
Ålesund sjukehus	190
Healthregion Northern Norway TOTAL Man-Labor years	1008
Hammerfest sykehus	57
Harstad sykehus	71
Helgelandssykehuset Mo i Rana	42
Helgelandssykehuset Mosjøen	30
Helgelandssykehuset Sandnessjøen	43
Kirkenes sykehus	35
Longearbyen sykehus	3
Narvik sykehus	30
Nordlandssykehuset Lofoten	21
Nordlandssykehuset Sentrum	197
Nordlandssykehuset Vesterålen	28
Stokmarknes sykehus	0
Universitetssykehuset i Nord-Norge	458

Appendix D: The number of contracted private specialists measured in man-labor years by municipal

Mucipality	Man-labor years
Halden	4.2
Moss	9.2
Sarpsborg	11.2
Fredrikstad	20.8
Spydeberg	0.2
Askim	0.8
Råde	1
Rygge	0.2
Våler	0.2
Hobøl	3.7
Vestby	2
Ski	5.8
Frogn	4.7
Nesodden	5.4
Oppegård	3.2
Bærum	37.61
Asker	15.38
Rælingen	7.64
Lørenskog	4.12
Skedsmo	18.03
Nittedal	1.04
Ullensaker	4.3
Nannestad	2.75
Oslo	198.86
Kongsvinger	2.28
Hamar	13.7
Ringsaker	3.2
Løten	0.2
Elverum	6.45
Åmot	0.2
Tynset	2
Lillehammer	8.9
Gjøvik	7.4
Sør-Fron	0.4
Østre Toten	0.5
Vestre Toten	0.2
Jevnaker	1

Mucipality	Man-labor years
Lunner	1
Gran	0.75
Drammen	15.4
Kongsberg	7.1
Ringerike	2.5
Nes	0.8
Modum	1
Øvre Eiker	0.8
Horten	3.2
Holmestrand	1.2
Tønsberg	16.13
Sandefjord	9.2
Larvik	6.15
Stokke	0.2
Lardal	1
Porsgrunn	6.6
Skien	8.29
Notodden	2.6
Bamble	0.2
Kragerø	0.2
Tinn	0.2
Hjartdal	1
Seljord	0.8
Tokke	0.4
Risør	1.4
Grimstad	0.62
Arendal	1
Tvedestrand	0.5
Froland	8.8
Kristiansand	22.97
Mandal	1
Farsund	1
Flekkefjord	1
Songdalen	2.3
Søgne	0.2
Eigersund	2.2
Sandnes	8
Stavanger	19.3
Haugesund	12.7
Time	1.2
Sola	1.2
Randaberg	2.6

Mucipality	Man-labor years
Strand	0.5
Sauda	1
Kvitsøy	0.2
Bergen	46.36
Etne	1
Bømlo	0.2
Stord	3.9
Kvinnherad	1.2
Odda	1
Eidfjord	1
Voss	3.2
Kvam	0.5
Os	14.45
Fjell	7
Flora	2
Lærdal	0.84
Fjaler	0.2
Førde	1.2
Naustdal	1
Molde	2.2
Ålesund	6.5
Kristiansund	2.2
Volda	0.2
Rindal	1
Trondheim	31.25
Rissa	0.3
Oppdal	1.4
Røros	1.27
Midtre Gauldal	0.2
Steinkjer	1.4
Namsos	3
Stjørdal	1.2
Levanger	7.5
Bodø	13.45
Narvik	2.85
Sømna	0.75
Alstahaug	0.2
Vefsn	0.32
Rana	1.575
Fauske	0.8
Vestvågøy	0.2
Hadsel	0.2

Mucipality	Man-labor years
Øksnes	1.6
Sortland	1
Tromsø	14.2
Kvæfjord	1
Bjarkøy	0.2
Alta	3.2
Porsanger Porsángu Porsanki	1
Kárásjohka Karasjok	1.2

Appendix E: Accessibility indices for effective beds adjusted for distance in time

The table below shows the *per resident effective beds adjusted for distance in time* and *standardized index* for all of the 430 municipalities in Norway

Municipality	Beds per residents adjusted *time*	Standardized Index
Oslo	0.008511326	9.67415
Odda	0.004083355	3.202775
Skien	0.003997651	3.077522
Porsgrunn	0.003876089	2.899862
Siljan	0.003840788	2.84827
Lillehammer	0.003814669	2.810098
Øyer	0.003594075	2.487704
Bamble	0.003586099	2.476048
Ullensvang	0.003541927	2.411492
Gausdal	0.0034539	2.282842
Kragerø	0.003418799	2.231543
Drammen	0.003372028	2.163188
Tinn	0.003289926	2.043198
Lier	0.003277198	2.024597
Drangedal	0.003268547	2.011954
Nedre Eiker	0.003192087	1.900209
Voss	0.003177791	1.879315
Ringebu	0.003156627	1.848384
Eidfjord	0.003156564	1.848292
Røyken	0.003152276	1.842027
Jondal	0.003151031	1.840206
Lærdal	0.003138121	1.821339
Hurum	0.002984327	1.596572
Tynset	0.002980661	1.591214
Bodø	0.002954316	1.552712
Sør-Fron	0.00294258	1.53556
Vaksdal	0.00294112	1.533426
Bergen	0.002932718	1.521147
Ålesund	0.002895125	1.466206
Granvin	0.002892354	1.462156
Nord-Fron	0.002856234	1.409368
Nes	0.002780299	1.298391

Municipality	Beds per residents adjusted *time*	Standardized Index
Ulvik	0.002758009	1.265814
Alvdal	0.002738741	1.237655
Tolga	0.002723349	1.21516
Ullensaker	0.002712676	1.199561
Hamar	0.002710534	1.19643
Elverum	0.002701102	1.182645
Nissedal	0.002692384	1.169904
Løten	0.002690402	1.167008
Meland	0.002681817	1.154462
Lindås	0.002673076	1.141686
Sogndal	0.002654636	1.114737
Stange	0.002644556	1.100006
Fauske	0.002581342	1.00762
Nannestad	0.00257179	0.99366
Ringsaker	0.002569338	0.990076
Aurland	0.002567258	0.987036
Kvam	0.002532418	0.936118
Vinje	0.00252846	0.930334
Ringerike	0.00252247	0.921579
Sel	0.002508046	0.900499
Levanger	0.002493603	0.879392
Leikanger	0.002489844	0.873897
Hurdal	0.002489736	0.873739
Eidsvoll	0.002487477	0.870439
Radøy	0.002475714	0.853247
Osterøy	0.002469316	0.843896
Molde	0.002452768	0.819712
Os	0.002449904	0.815526
Sørfold	0.002442275	0.804376
Hole	0.002438522	0.798891
Fyresdal	0.002431243	0.788253
Arendal	0.002430765	0.787555
Verdal	0.002426639	0.781525
Oppegård	0.002425549	0.779932
Samnanger	0.002416568	0.766806
Haugesund	0.002402346	0.746021
Saltdal	0.002398151	0.73989
Luster	0.002383214	0.71806
Utsira	0.002378762	0.711554
Tokke	0.002375651	0.707007
Stjørdal	0.002359867	0.683939
Kristiansund	0.002352607	0.673329
Frei	0.002352607	0.673329

Municipality	Beds per residents adjusted *time*	Standardized Index
Rendalen	0.002352245	0.6728
Kongsvinger	0.002347054	0.665213
Kongsberg	0.002342712	0.658867
Ski	0.002338223	0.652307
Inderøy	0.002330638	0.641222
Folldal	0.002328789	0.63852
Åmot	0.002325814	0.634171
Austrheim	0.002316048	0.619899
Våler	0.002303313	0.601287
Tysvær	0.002297208	0.592364
Sveio	0.002293992	0.587664
Vestby	0.002291923	0.584641
Frogn	0.002284296	0.573494
Froland	0.002282791	0.571295
Vestnes	0.002279211	0.566063
Malvik	0.00227578	0.561047
Steinkjer	0.002271455	0.554727
Ås	0.002269118	0.551312
Fræna	0.002268791	0.550833
Tvedestrand	0.002260274	0.538387
Grimstad	0.002257548	0.534402
Midsund	0.00224502	0.516093
Modalen	0.002243588	0.514
Åsnes	0.002243098	0.513284
Frosta	0.002241267	0.510608
Balestrand	0.002236307	0.503359
Karmøy	0.002234327	0.500466
Stavanger	0.002228423	0.491836
Vågå	0.002224922	0.486721
Fedje	0.002224706	0.486405
Gjemnes	0.002218161	0.476839
Rana	0.002214356	0.471278
Dovre	0.002209657	0.464411
Modum	0.002206236	0.45941
Stord	0.002203358	0.455204
Trysil	0.002190224	0.436009
Sør-Odal	0.002188341	0.433258
Nesodden	0.002187424	0.431918
Mosvik	0.002187371	0.431841
Aukra	0.002180475	0.421762
Øvre Eiker	0.002175763	0.414875
Eide	0.002162625	0.395674
Kvitsøy	0.002160587	0.392697

Municipality	Beds per residents adjusted *time*	Standardized Index
Vegårshei	0.002143104	0.367145
Alstahaug	0.002140069	0.362709
Sandnes	0.002136077	0.356876
Namdalseid	0.002134112	0.354004
Verran	0.002132384	0.351479
Leirfjord	0.002127584	0.344463
Lillesand	0.002126671	0.343129
Randaberg	0.002126	0.342148
Beiarn	0.002120513	0.334129
Nesna	0.002117978	0.330424
Lørenskog	0.002110265	0.319152
Krødsherad	0.002105744	0.312545
Gildeskål	0.002104356	0.310516
Flesberg	0.002101954	0.307005
Vefsn	0.002100035	0.3042
Førde	0.002095914	0.298178
Hemnes	0.002092832	0.293674
Eidskog	0.002089285	0.28849
Tønsberg	0.002088753	0.287712
Risør	0.002084665	0.281738
Sola	0.00208394	0.280678
Stor-Elvdal	0.002079293	0.273887
Gjesdal	0.002067335	0.256411
Rennesøy	0.002054184	0.237191
Rauma	0.002049279	0.230022
Klepp	0.002044727	0.22337
Bokn	0.002043331	0.221329
Skedsmo	0.002040603	0.217343
Masfjorden	0.002040223	0.216787
Nord-Odal	0.002039221	0.215322
Birkenes	0.002036483	0.211322
Nøtterøy	0.0020363	0.211054
Sarpsborg	0.002034105	0.207846
Rælingen	0.002033812	0.207418
Stokke	0.002029494	0.201106
Grue	0.002027717	0.198509
Andebu	0.002025174	0.194793
Gjøvik	0.002021969	0.190109
Selbu	0.00202072	0.188284
Leksvik	0.002019553	0.186578
Råde	0.002019064	0.185864
Lardal	0.00201336	0.177527
Horten	0.002011038	0.174134

Municipality	Beds per residents adjusted *time*	Standardized Index
Re	0.002004922	0.165195
Gjerstad	0.002003503	0.163122
Fredrikstad	0.002000521	0.158763
Tromsø	0.001998685	0.156081
Tysnes	0.001997526	0.154386
Namsos	0.001996169	0.152403
Time	0.001992552	0.147117
Nesset	0.001991463	0.145525
Holmestrand	0.001990642	0.144325
Gaular	0.001990194	0.14367
Vindafjord	0.001987697	0.140022
Ølen	0.001987697	0.140022
Larvik	0.001987441	0.139647
Moss	0.001984918	0.13596
Rygge	0.001983758	0.134265
Nittedal	0.001982162	0.131933
Fet	0.001980294	0.129202
Lesja	0.001968057	0.111318
Gjerdrum	0.001965516	0.107604
Sandefjord	0.001964375	0.105937
Åmli	0.001960911	0.100875
Tingvoll	0.00196015	0.099762
Naustdal	0.001955875	0.093514
Trondheim	0.001953715	0.090357
Bømlo	0.001949139	0.08367
Hof	0.001948048	0.082075
Bærum	0.001946335	0.079572
Sørum	0.001945958	0.079021
Sande	0.001940872	0.071588
Lom	0.001940713	0.071355
Fitjar	0.001934169	0.061791
Sunndal	0.001927733	0.052385
Tjøme	0.001924343	0.047431
Skiptvet	0.001922583	0.044859
Etne	0.001920528	0.041856
Halden	0.00192027	0.041479
Våler	0.001918644	0.039102
Halsa	0.001918258	0.038538
Asker	0.001901559	0.014133
Meråker	0.001897122	0.007648
Østre Toten	0.001896087	0.006135
Averøy	0.001893401	0.00221
Vestre Toten	0.001892126	0.000346

Municipality	Beds per residents adjusted *time*	Standardized Index
Rakkestad	0.00188926	-0.003841
Snåsa	0.001888797	-0.004518
Bjerkreim	0.001888769	-0.004559
Meløy	0.001878871	-0.019026
Finnøy	0.00187442	-0.025531
Askim	0.001858999	-0.048067
Eid	0.001857243	-0.050633
Skodje	0.001855699	-0.052891
Hå	0.001854067	-0.055276
Enebakk	0.001853134	-0.05664
Skjåk	0.001852227	-0.057965
Haram	0.001851732	-0.058688
Forsand	0.001845654	-0.067572
Ørskog	0.001845574	-0.067689
Melhus	0.001843049	-0.071378
Dønna	0.001839419	-0.076684
Fjaler	0.001835428	-0.082516
Spydeberg	0.001834688	-0.083597
Sandøy	0.00183295	-0.086138
Rollag	0.001832238	-0.087178
Overhalla	0.001823497	-0.099954
Eidsberg	0.001821449	-0.102946
Søndre Land	0.001820246	-0.104704
Grong	0.001811552	-0.117411
Svelvik	0.001800085	-0.134169
Hobøl	0.001798387	-0.136651
Osen	0.001797207	-0.138375
Surnadal	0.001795377	-0.141049
Flå	0.001795232	-0.141261
Skaun	0.001788226	-0.151501
Klæbu	0.00178779	-0.152138
Sigdal	0.001786383	-0.154194
Aurskog-Høland	0.001785881	-0.154927
Stordal	0.001783164	-0.158898
Trøgstad	0.00177701	-0.167892
Smøla	0.001775053	-0.170752
Fosnes	0.001773674	-0.172768
Strand	0.001766307	-0.183535
Moskenes	0.001744564	-0.215312
Høyanger	0.001744187	-0.215862
Hamarøy	0.001738358	-0.224382
Evje og Hornnes	0.001737327	-0.225889
Eigersund	0.001736633	-0.226903

Municipality	Beds per residents adjusted *time*	Standardized Index
Jølster	0.001736463	-0.227151
Iveland	0.001731057	-0.235052
Tydal	0.001730932	-0.235234
Flatanger	0.001725603	-0.243022
Vevelstad	0.001725092	-0.24377
Gloppen	0.001721061	-0.24966
Gran	0.001719672	-0.251691
Orkdal	0.001718193	-0.253853
Herøy	0.001717801	-0.254426
Rindal	0.001713133	-0.261247
Nordre Land	0.001712929	-0.261546
Notodden	0.001706377	-0.271121
Suldal	0.001706177	-0.271413
Høylandet	0.001704289	-0.274173
Kvinnherad	0.00170336	-0.275531
Sula	0.001698062	-0.283273
Vestvågøy	0.00169797	-0.283408
Askvoll	0.001697909	-0.283497
Aremark	0.00169253	-0.291358
Sortland	0.001685699	-0.301342
Flakstad	0.001682864	-0.305485
Marker	0.001681647	-0.307264
Hvaler	0.001681609	-0.307319
Sykkylven	0.001681593	-0.307342
Hadsel	0.001681172	-0.307958
Steigen	0.001680844	-0.308437
Lurøy	0.001680725	-0.30861
Midtre Gauldal	0.001672568	-0.320532
Giske	0.00165847	-0.341137
Hyllestad	0.001657025	-0.343247
Flora	0.001653342	-0.348631
Norddal	0.001650475	-0.35282
Lunner	0.001642581	-0.364358
Hornindal	0.001630257	-0.382369
Sauda	0.001628581	-0.384818
Hammerfest	0.001609431	-0.412805
Stranda	0.001609382	-0.412877
Snillfjord	0.001606911	-0.416488
Nore og Uvdal	0.001597473	-0.430282
Rømskog	0.001595526	-0.433127
Balsfjord	0.001595007	-0.433886
Ørsta	0.001593945	-0.435438
Hjelmeland	0.001589823	-0.441463

Municipality	Beds per residents adjusted *time*	Standardized Index
Volda	0.001577721	-0.459148
Stryn	0.00157501	-0.46311
Lund	0.001574358	-0.464063
Jevnaker	0.001569887	-0.470598
Hareid	0.00156409	-0.479071
Sokndal	0.001562767	-0.481004
Karlsøy	0.001557015	-0.48941
Bygland	0.00155518	-0.492091
Ulstein	0.001553369	-0.494738
Kristiansand	0.001548444	-0.501937
Sauherad	0.001547465	-0.503367
Vågan	0.001543915	-0.508555
Grane	0.001540299	-0.513841
Bremanger	0.001539795	-0.514576
Etnedal	0.0015345	-0.522315
Storfjord	0.001533606	-0.523622
Hattfjelldal	0.001522331	-0.540099
Målselv	0.00152005	-0.543433
Hjartdal	0.001518423	-0.545811
Gulen	0.001514857	-0.551023
Meldal	0.001510798	-0.556955
Agdenes	0.00150379	-0.567196
Rissa	0.001502008	-0.569801
Vågsøy	0.001500175	-0.57248
Søgne	0.001499015	-0.574176
Songdalen	0.001496637	-0.577651
Bø	0.001488406	-0.58968
Aure	0.001487786	-0.590587
Tustna	0.001487786	-0.590587
Lavangen	0.001484706	-0.595088
Sør-Aurdal	0.001484197	-0.595831
Nes	0.001478955	-0.603493
Gol	0.001474033	-0.610686
Bardu	0.001472402	-0.61307
Kvalsund	0.001472034	-0.613608
Vik	0.001471181	-0.614854
Nome	0.001469506	-0.617303
Selje	0.001461472	-0.629043
Rennebu	0.001460434	-0.63056
Vennesla	0.001454092	-0.63983
Lyngen	0.001451463	-0.643672
Øksnes	0.001442582	-0.656651
Askøy	0.001430939	-0.673667

Municipality	Beds per residents adjusted *time*	Standardized Index
Fjell	0.001426356	-0.680365
Ibestad	0.001424273	-0.683409
Mandal	0.001422797	-0.685567
Nærøy	0.001420146	-0.68944
Bø	0.001417277	-0.693633
Herøy	0.001406859	-0.708859
Lindesnes	0.001405556	-0.710764
Gratangen	0.001402194	-0.715678
Evenes	0.001398735	-0.720732
Lierne	0.00139108	-0.73192
Marnardal	0.001389279	-0.734552
Nord-Aurdal	0.001385971	-0.739387
Sande	0.001385253	-0.740437
Sørreisa	0.001376522	-0.753196
Namsskogan	0.001375543	-0.754627
Seljord	0.001368654	-0.764695
Engerdal	0.001367146	-0.766898
Narvik	0.001366308	-0.768124
Os	0.001353582	-0.786722
Lyngdal	0.001352828	-0.787825
Sund	0.001347946	-0.794959
Lenvik	0.001337687	-0.809953
Oppdal	0.001331021	-0.819695
Ål	0.001329941	-0.821274
Tranøy	0.001327879	-0.824286
Audnedal	0.001327377	-0.82502
Hemne	0.00132575	-0.827398
Harstad	0.001320429	-0.835175
Skånland	0.00131641	-0.841048
Kvinesdal	0.001313091	-0.845899
Salangen	0.001306075	-0.856153
Kviteseid	0.001301904	-0.862249
Dyrøy	0.001298694	-0.86694
Ørland	0.001285724	-0.885895
Vikna	0.001284675	-0.887428
Vanylven	0.001282794	-0.890178
Hemsedal	0.001282059	-0.891251
Brønnøy	0.001277587	-0.897788
Holtålen	0.001270377	-0.908324
Flekkefjord	0.001269265	-0.909949
Vega	0.001267799	-0.912092
Valle	0.001265997	-0.914726
Røyrvik	0.001263349	-0.918596

Municipality	Beds per residents adjusted *time*	Standardized Index
Øystre Slidre	0.001263122	-0.918928
Tjeldsund	0.001262991	-0.919119
Gáivuotna Kåfjord	0.00125823	-0.926078
Åfjord	0.001254469	-0.931574
Bjugn	0.001247726	-0.941429
Vestre Slidre	0.00123722	-0.956782
Værøy	0.001233552	-0.962143
Hægebostad	0.001229135	-0.968599
Øygarden	0.001227676	-0.970731
Årdal	0.001212183	-0.993373
Farsund	0.001212132	-0.993449
Kvæfjord	0.001209401	-0.99744
Åseral	0.001203865	-1.005531
Solund	0.001193457	-1.020741
Fusa	0.001173032	-1.050591
Rødøy	0.001154818	-1.077211
Leka	0.001150088	-1.084124
Austevoll	0.001145632	-1.090636
Bjarkøy	0.001145091	-1.091427
Hitra	0.001140734	-1.097794
Sømna	0.001139818	-1.099133
Bykle	0.001139578	-1.099484
Hol	0.001125771	-1.119664
Røros	0.001117763	-1.131367
Vang	0.001116937	-1.132574
Ballangen	0.001111751	-1.140153
Andøy	0.001106663	-1.147589
Lødingen	0.001099872	-1.157513
Sirdal	0.001094649	-1.165147
Roan	0.001083336	-1.18168
Porsanger Porsángu Porsanki	0.001063468	-1.210717
Torsken	0.001062015	-1.21284
Berg	0.001055723	-1.222036
Sør-Varanger	0.001050257	-1.230025
Frøya	0.00104572	-1.236656
Alta	0.001045176	-1.23745
Nordreisa	0.001006802	-1.293533
Tysfjord	0.000966097	-1.353022
Træna	0.000927213	-1.409851
Skjervøy	0.000911687	-1.432542
Måsøy	0.000896114	-1.455301
Kárásjohka Karasjok	0.000869705	-1.493897

Municipality	Beds per residents adjusted *time*	Standardized Index
Nordkapp	0.000851839	-1.520007
Unjárga Nesseby	0.000849192	-1.523877
Deatnu Tana	0.00083496	-1.544676
Bindal	0.000828454	-1.554185
Røst	0.000811151	-1.579472
Kvænangen	0.000732138	-1.694948
Loppa	0.000702518	-1.738237
Vadsø	0.000686318	-1.761912
Guovdageaidnu Kautokeino	0.000680818	-1.769951
Gamvik	0.0005636	-1.941262
Båtsfjord	0.000558031	-1.949402
Lebesby	0.000544085	-1.969783
Hasvik	0.000542494	-1.972108
Vardø	0.000509472	-2.02037
Berlevåg	0.0004936	-2.043566

Appendix F: Accessibility indices for effective beds adjusted for distance in km

The table below shows the *per resident effective beds adjusted for distance in km* and *standardized index* for all of the 430 municipalities in Norway

Municipality	Beds per residents adjusted *km*	Standardized Index
Oslo	0.00693852	9.7621986181219400
Odda	0.003706688	5.0624018621923900
Lillehammer	0.003567861	4.8605161340107500
Skien	0.003376973	4.5829240169586100
Tinn	0.003078203	4.1484457994265400
Drammen	0.003005115	4.0421603117339200
Bergen	0.002904283	3.8955275003462000
Tynset	0.002853945	3.8223254364650200
Lærdal	0.002808112	3.7556743839016200
Voss	0.002681058	3.5709100917924500
Bodø	0.002566038	3.4036445320270700
Ålesund	0.002282237	2.9909355198021700
Arendal	0.002234013	2.9208070981973700
Ringerike	0.002176879	2.8377216372488300
Kongsvinger	0.002054511	2.6597715450154900
Haugesund	0.002040536	2.6394493940019900
Kongsberg	0.002028957	2.6226106427298900
Stavanger	0.001980384	2.5519741999318400
Trondheim	0.001927814	2.4755263194240400
Førde	0.001765507	2.2394960726812800
Gjøvik	0.001758146	2.2287912037475700
Stord	0.001757916	2.2284578072178900
Kristiansand	0.001753604	2.2221863766844100
Lørenskog	0.001733308	2.1926711472580500
Tromsø	0.001684016	2.1209902991151200
Eid	0.001637824	2.0538176908383100
Utsira	0.001605143	2.0062910885590600
Bærum	0.001574126	1.9611862903768200
Molde	0.001519679	1.8820082203241300

Municipality	Beds per residents adjusted *km*	Standardized Index
Notodden	0.001427172	1.7474828730984700
Hammerfest	0.001408159	1.7198334845907400
Levanger	0.001360818	1.6509890932046600
Hamar	0.001274177	1.5249944216985200
Elverum	0.001274177	1.5249944216923800
Rana	0.001235049	1.4680938973050200
Tønsberg	0.00111528	1.2939221180242200
Alstahaug	0.001014041	1.1466989670643400
Kristiansund	0.00086229	0.9260196328051210
Frei	0.00086229	0.9260196328051210
Sør-Varanger	0.000842134	0.8967086915138770
Namsos	0.000717278	0.7151405788614200
Fredrikstad	0.00070468	0.6968199509817860
Hadsel	0.000664151	0.6378815890766910
Porsgrunn	0.000629403	0.5873502509156810
Harstad	0.000560895	0.4877250392943810
Sarpsborg	0.000516328	0.4229144171285670
Volda	0.0005097	0.4132751272076560
Larvik	0.000465966	0.3496767397557820
Lier	0.000431977	0.3002495240624180
Vefsn	0.000429018	0.2959468506186350
Kragerø	0.000425277	0.2905056504441320
Vestvågøy	0.000392453	0.2427725999535970
Narvik	0.000386637	0.2343144202324260
Flekkefjord	0.000386387	0.2339519479404990
Kvitsøy	0.000384155	0.2307055632488870
Nøtterøy	0.000342654	0.1703539579122710
Skedsmo	0.000318152	0.1347232872835850
Sandefjord	0.000281841	0.0819183119109417
Moss	0.000278507	0.0770707933135370
Halden	0.000268652	0.0627389700105214
Asker	0.00023281	0.0106170061213873
Nedre Eiker	0.000210209	-0.0222505126809319
Hole	0.00020976	-0.0229028544686774
Rælingen	0.000205054	-0.0297465233107491
Vestnes	0.00019369	-0.0462726406793808
Randaberg	0.000183286	-0.0614026323097121

Municipality	Beds per residents adjusted *km*	Standardized Index
Lardal	0.000176557	-0.0711874823541158
Siljan	0.000174991	-0.0734647455041535
Naustdal	0.000173503	-0.0756292037843274
Songdalen	0.000149819	-0.1100704353459970
Askim	0.000138544	-0.1264666033162710
Vestre Toten	0.000135913	-0.1302929184814290
Rygge	0.00012392	-0.1477328714045560
Froland	0.000118103	-0.1561929873724050
Askøy	0.000108187	-0.1706125951036400
Tysvær	0.000107874	-0.1710671674275540
Verdal	0.000103115	-0.1779889756067990
Sandnes	9.85975E-05	-0.1845578862429740
Søgne	9.45783E-05	-0.1904026504374100
Røyken	9.27008E-05	-0.1931330474243790
Stange	9.01064E-05	-0.1969058797488410
Løten	8.81236E-05	-0.1997892900712990
Oppegård	8.36923E-05	-0.2062333620520900
Fjell	7.70043E-05	-0.2159591348974950
Ørsta	7.62351E-05	-0.2170778092836910
Stokke	7.43391E-05	-0.2198349362364630
Sveio	7.23104E-05	-0.2227851243317690
Øyer	7.07903E-05	-0.2249957333815920
Vennesla	7.00653E-05	-0.2260499270265480
Fet	5.06056E-05	-0.2543486613377620
Andebu	4.95484E-05	-0.2558861150695080
Karmøy	4.65705E-05	-0.2602165694706760
Dønna	4.05161E-05	-0.2690210915973800
Ringsaker	3.78024E-05	-0.2729674136136980
Melhus	3.74925E-05	-0.2734179682554590
Råde	3.5972E-05	-0.2756291800661880
Gaular	3.4336E-05	-0.2780083351804800
Herøy	3.25149E-05	-0.2806565467635270
Østre Toten	3.09389E-05	-0.2829483768714670
Aukra	2.9555E-05	-0.2849608361521660
Tolga	2.81193E-05	-0.2870486680723390
Nittedal	2.7029E-05	-0.2886342612511110
Gjerdrum	2.60946E-05	-0.2899930621689690

Municipality	Beds per residents adjusted *km*	Standardized Index
Horten	2.54651E-05	-0.2909085766354100
Grimstad	2.5319E-05	-0.2911209933399980
Sola	2.53061E-05	-0.2911397258299690
Spydeberg	2.44252E-05	-0.2924207257848530
Alvdal	2.39617E-05	-0.2930947632676640
Gloppen	2.26719E-05	-0.2949705185719600
Leirfjord	2.05469E-05	-0.2980607132474860
Fræna	2.02116E-05	-0.2985483277650870
Sør-Odal	1.98419E-05	-0.2990858418433370
Granvin	1.88021E-05	-0.3005980337938570
Øvre Eiker	1.80902E-05	-0.3016332809543360
Klæbu	1.78882E-05	-0.3019269843320420
Kvæfjord	1.66022E-05	-0.3037971548502240
Gausdal	1.64401E-05	-0.3040329071106190
Tjøme	1.61319E-05	-0.3044810541575850
Flesberg	1.60431E-05	-0.3046102245175680
Meland	1.57044E-05	-0.3051027099260180
Våler	1.54224E-05	-0.3055128245067480
Re	1.51585E-05	-0.3058966193779540
Rennesøy	1.41688E-05	-0.3073357586250260
Sauherad	1.19825E-05	-0.3105151392875150
Tvedestrand	1.11513E-05	-0.3117239626972610
Eidsberg	1.09709E-05	-0.3119863143633780
Lindås	1.09566E-05	-0.3120070815326500
Ski	1.06669E-05	-0.3124283468819840
Klepp	9.88527E-06	-0.3135650267449110
Skiptvet	8.54156E-06	-0.3155190756439150
Sørum	8.52485E-06	-0.3155433740025990
Trøgstad	7.77887E-06	-0.3166281999211830
Hurum	7.61587E-06	-0.3168652290575560
Gjesdal	7.32319E-06	-0.3172908591968820
Bamble	7.04219E-06	-0.3176994865045610
Bømlo	5.4297E-06	-0.3200444047724060
Holmestrand	5.24914E-06	-0.3203069884590990
Tysnes	5.15405E-06	-0.3204452635920720
Malvik	5.12966E-06	-0.3204807279387660
Os	5.07264E-06	-0.3205636531313050

Municipality	Beds per residents adjusted *km*	Standardized Index
Skaun	4.87511E-06	-0.3208509105423950
Sund	4.68264E-06	-0.3211308036803090
Overhalla	4.64348E-06	-0.3211877471946750
Inderøy	4.55325E-06	-0.3213189583677730
Kvinesdal	4.3791E-06	-0.3215722150431920
Ullensaker	3.95718E-06	-0.3221857732465490
Eidskog	3.84892E-06	-0.3223432089051780
Osterøy	3.79598E-06	-0.3224202032714870
Hjartdal	3.53761E-06	-0.3227959309354090
Rakkestad	3.10651E-06	-0.3234228464294040
Søndre Land	3.1019E-06	-0.3234295435056170
Time	3.0989E-06	-0.3234339128707870
Sogndal	3.06567E-06	-0.3234822231806270
Bjarkøy	2.48317E-06	-0.3243293203934740
Enebakk	2.48292E-06	-0.3243296725368290
Hvaler	2.40176E-06	-0.3244477063099020
Kvalsund	2.24799E-06	-0.3246713109736060
Hobøl	2.2258E-06	-0.3247035840616480
Modum	1.98513E-06	-0.3250535733276720
Hornindal	1.89861E-06	-0.3251793874152750
Midsund	1.87288E-06	-0.3252168128219710
Frogn	1.83519E-06	-0.3252716233734490
Ulvik	1.74014E-06	-0.3254098399320540
Flakstad	1.66952E-06	-0.3255125441822860
Grue	1.66162E-06	-0.3255240287931990
Ås	1.59544E-06	-0.3256202758683480
Sortland	1.4896E-06	-0.3257741799271830
Vaksdal	1.45627E-06	-0.3258226539414080
Stjørdal	1.42637E-06	-0.3258661302736970
Ullensvang	1.32035E-06	-0.3260203160344420
Austevoll	1.2509E-06	-0.3261213097389200
Vestby	1.2058E-06	-0.3261868856731450
Fosnes	1.10017E-06	-0.3263405021376880
Fitjar	1.05851E-06	-0.3264010781449800
Våler	9.70368E-07	-0.3265292611113130
Aurland	9.42017E-07	-0.3265704907250860
Bø	8.89986E-07	-0.3266461550825370

Municipality	Beds per residents adjusted *km*	Standardized Index
Eide	8.74813E-07	-0.3266682202957960
Finnøy	8.11432E-07	-0.3267603891244480
Åmot	7.64294E-07	-0.3268289381462150
Vegårshei	7.05785E-07	-0.3269140244533210
Lillesand	7.05785E-07	-0.3269140244533210
Gjemnes	7.02054E-07	-0.3269194500778920
Nesna	7.0149E-07	-0.3269202695538500
Hof	5.82738E-07	-0.3270929605690030
Kvinnherad	5.3361E-07	-0.3271644039844260
Fjaler	4.84903E-07	-0.3272352352783650
Mandal	4.53686E-07	-0.3272806311815730
Mosvik	4.47464E-07	-0.3272896792402970
Rissa	4.33502E-07	-0.3273099828112050
Nord-Odal	3.70764E-07	-0.3274012182944560
Orkdal	3.69406E-07	-0.3274031925580020
Hemnes	3.63007E-07	-0.3274124992390060
Bokn	3.46791E-07	-0.3274360798068090
Nes	3.25643E-07	-0.3274668339835210
Sande	3.095E-07	-0.3274903098677060
Nannestad	3.05457E-07	-0.3274961892925210
Frosta	2.88607E-07	-0.3275206931206090
Nesodden	2.85688E-07	-0.3275249368129350
Os	2.77054E-07	-0.3275374930634690
Steinkjer	2.71599E-07	-0.3275454255897970
Ulstein	2.70853E-07	-0.3275465107052260
Aurskog-Høland	2.68223E-07	-0.3275503358012630
Nome	2.68059E-07	-0.3275505745411240
Sandøy	2.64537E-07	-0.3275556957536070
Radøy	2.45108E-07	-0.3275839504407010
Tjeldsund	2.4403E-07	-0.3275855179159220
Nordre Land	2.25827E-07	-0.3276119882731350
Skånland	1.91962E-07	-0.3276612350949960
Aremark	1.8364E-07	-0.3276733381586340
Krødsherad	1.80081E-07	-0.3276785136004790
Namdalseid	1.71775E-07	-0.3276905925944830
Forsand	1.67135E-07	-0.3276973398936040
Marnardal	1.54186E-07	-0.3277161706639600

Municipality	Beds per residents adjusted *km*	Standardized Index
Samnanger	1.45721E-07	-0.3277284797101570
Moskenes	1.41471E-07	-0.3277346604941770
Stryn	1.32805E-07	-0.3277472635869700
Jølster	1.19576E-07	-0.3277665016410760
Bremanger	1.13169E-07	-0.3277758186551050
Drangedal	1.08647E-07	-0.3277823940060370
Åsnes	1.01321E-07	-0.3277930484976180
Marker	9.34509E-08	-0.3278044927161920
Hå	8.13533E-08	-0.3278220852582960
Midtre Gauldal	7.60885E-08	-0.3278297413939570
Risør	7.51368E-08	-0.3278311254352390
Vanylven	6.95174E-08	-0.3278392972799710
Bjerkreim	6.66064E-08	-0.3278435304272140
Vindafjord	6.08689E-08	-0.3278518739891020
Ølen	6.08689E-08	-0.3278518739891020
Lindesnes	5.23196E-08	-0.3278643066410620
Birkenes	4.93684E-08	-0.3278685983631540
Audnedal	4.77801E-08	-0.3278709080793660
Leikanger	4.59716E-08	-0.3278735380727270
Øygarden	4.25899E-08	-0.3278784557863460
Hareid	4.05111E-08	-0.3278814787565670
Ringebu	3.76178E-08	-0.3278856863226080
Hjelmeland	3.51211E-08	-0.3278893170917500
Sigdal	3.25586E-08	-0.3278930434949780
Ballangen	3.13508E-08	-0.3278947998643050
Lyngdal	2.709E-08	-0.3279009959713650
Grong	2.51088E-08	-0.3279038770903300
Fauske	2.25983E-08	-0.3279075279933630
Vågsøy	2.23959E-08	-0.3279078222417830
Værøy	2.21723E-08	-0.3279081474600950
Fusa	2.20126E-08	-0.3279083796387690
Rauma	1.95702E-08	-0.3279119314105450
Gran	1.91618E-08	-0.3279125253225560
Rendalen	1.82509E-08	-0.3279138500747900
Strand	1.81524E-08	-0.3279139933189610
Høylandet	1.78717E-08	-0.3279144014530430
Nesset	1.73572E-08	-0.3279151496126680

Municipality	Beds per residents adjusted *km*	Standardized Index
Eidsvoll	1.5538E-08	-0.3279177952082350
Høyanger	1.52404E-08	-0.3279182279963740
Ibestad	1.51429E-08	-0.3279183696814950
Luster	1.35722E-08	-0.3279206539066370
Flora	1.32493E-08	-0.3279211233931390
Askvoll	1.2987E-08	-0.3279215049147180
Sande	1.29562E-08	-0.3279215496546760
Vågan	1.16495E-08	-0.3279234499827870
Åmli	1.07975E-08	-0.3279246889944000
Rollag	1.04128E-08	-0.3279252484120150
Herøy	1.03976E-08	-0.3279252704402840
Gjerstad	1.03741E-08	-0.3279253046737010
Karlsøy	1.01421E-08	-0.3279256420641920
Gratangen	9.82892E-09	-0.3279260974482680
Austrheim	9.79329E-09	-0.3279261492707030
Leksvik	8.49941E-09	-0.3279280308546720
Hurdal	8.34198E-09	-0.3279282597895840
Snillfjord	7.93987E-09	-0.3279288445424380
Vinje	7.68951E-09	-0.3279292086307920
Lunner	6.96057E-09	-0.3279302686645570
Selje	6.88179E-09	-0.3279303832221540
Evenes	6.81678E-09	-0.3279304777694090
Etne	6.61092E-09	-0.3279307771293500
Svelvik	6.04501E-09	-0.3279316000966820
Vevelstad	4.70899E-09	-0.3279335429555030
Folldal	4.59153E-09	-0.3279337137742260
Verran	3.79127E-09	-0.3279348775209440
Sula	3.00891E-09	-0.3279360152553650
Jondal	2.96735E-09	-0.3279360756823170
Seljord	2.69448E-09	-0.3279364724990770
Grane	2.58381E-09	-0.3279366334327930
Nærøy	1.98024E-09	-0.3279375111594420
Fedje	1.40733E-09	-0.3279383442948790
Sykkylven	1.40717E-09	-0.3279383445400910
Sør-Fron	1.38746E-09	-0.3279383731918390
Lavangen	1.20691E-09	-0.3279386357525180
Eidfjord	1.204E-09	-0.3279386399869980

Municipality	Beds per residents adjusted *km*	Standardized Index
Rømskog	1.09708E-09	-0.3279387954682180
Farsund	1.0708E-09	-0.3279388336854640
Kvam	1.00694E-09	-0.3279389265550090
Masfjorden	9.62421E-10	-0.3279389912958660
Jevnaker	9.44357E-10	-0.3279390175660750
Etnedal	8.86717E-10	-0.3279391013871670
Vega	8.77616E-10	-0.3279391146209330
Hægebostad	7.63752E-10	-0.3279392802054710
Selbu	7.36677E-10	-0.3279393195777840
Øksnes	6.74533E-10	-0.3279394099495750
Trysil	6.68854E-10	-0.3279394182068110
Salangen	5.92929E-10	-0.3279395286190900
Sørfold	5.47646E-10	-0.3279395944709070
Eigersund	4.48791E-10	-0.3279397382282520
Averøy	4.12306E-10	-0.3279397912853590
Røst	3.82166E-10	-0.3279398351156060
Agdenes	3.72282E-10	-0.3279398494881430
Meldal	3.50602E-10	-0.3279398810156970
Sør-Aurdal	3.46376E-10	-0.3279398871613370
Balestrand	2.91715E-10	-0.3279399666503770
Kviteseid	2.75603E-10	-0.3279399900814370
Sirdal	2.73797E-10	-0.3279399927081230
Hyllestad	2.10968E-10	-0.3279400840740480
Lødingen	1.97363E-10	-0.3279401038592950
Evje og Hornnes	1.71926E-10	-0.3279401408501590
Nord-Fron	1.69904E-10	-0.3279401437912630
Lyngen	1.55159E-10	-0.3279401652340750
Saltdal	1.46296E-10	-0.3279401781227890
Snåsa	1.37578E-10	-0.3279401907998730
Tokke	1.3001E-10	-0.3279402018054690
Åseral	1.27388E-10	-0.3279402056178120
Tingvoll	1.21725E-10	-0.3279402138536620
Flatanger	1.157E-10	-0.3279402226157270
Suldal	8.61835E-11	-0.3279402655389880
Osen	7.30627E-11	-0.3279402846195050
Hattfjelldal	7.05986E-11	-0.3279402882028660
Flå	6.54418E-11	-0.3279402957019780

Municipality	Beds per residents adjusted *km*	Standardized Index
Bø	6.36895E-11	-0.3279402982501630
Modalen	6.24264E-11	-0.3279403000870370
Gáivuotna Kåfjord	5.37556E-11	-0.3279403126963210
Tysfjord	5.01149E-11	-0.3279403179907080
Meråker	4.74226E-11	-0.3279403219058170
Brønnøy	4.45766E-11	-0.3279403260445700
Giske	4.42269E-11	-0.3279403265531670
Skodje	4.33974E-11	-0.3279403277593220
Halsa	3.97168E-11	-0.3279403331117860
Lurøy	3.29385E-11	-0.3279403429689390
Dyrøy	3.01328E-11	-0.3279403470490760
Ørskog	2.68969E-11	-0.3279403517547460
Rennebu	2.40384E-11	-0.3279403559116380
Gildeskål	2.18812E-11	-0.3279403590486500
Beiarn	2.14479E-11	-0.3279403596787310
Sunndal	1.89493E-11	-0.3279403633123640
Åfjord	1.74555E-11	-0.3279403654846830
Balsfjord	1.49461E-11	-0.3279403691339150
Smøla	1.43216E-11	-0.3279403700420730
Vikna	1.137E-11	-0.3279403743343470
Nore og Uvdal	1.04938E-11	-0.3279403756084260
Storfjord	8.53732E-12	-0.3279403784536260
Bardu	5.11967E-12	-0.3279403834236370
Gulen	5.09039E-12	-0.3279403834662280
Tranøy	4.88021E-12	-0.3279403837718740
Ørland	4.30446E-12	-0.3279403846091340
Iveland	4.08395E-12	-0.3279403849298050
Haram	3.24286E-12	-0.3279403861529450
Nord-Aurdal	2.96692E-12	-0.3279403865542120
Lund	2.57682E-12	-0.3279403871215070
Stor-Elvdal	2.48922E-12	-0.3279403872489030
Sokndal	2.06795E-12	-0.3279403878615220
Stranda	1.80297E-12	-0.3279403882468640
Rindal	1.76566E-12	-0.3279403883011120
Nissedal	1.60386E-12	-0.3279403885364020
Vik	1.33871E-12	-0.3279403889219950
Sauda	9.38454E-13	-0.3279403895040540

Municipality	Beds per residents adjusted *km*	Standardized Index
Hemne	8.69056E-13	-0.3279403896049740
Bjugn	5.48621E-13	-0.3279403900709570
Stordal	3.25588E-13	-0.3279403903952970
Bygland	3.22087E-13	-0.3279403904003880
Tydal	3.15676E-13	-0.3279403904097110
Sørreisa	2.74183E-13	-0.3279403904700510
Sel	2.17672E-13	-0.3279403905522310
Solund	1.60859E-13	-0.3279403906348490
Surnadal	1.58165E-13	-0.3279403906387670
Leka	9.54622E-14	-0.3279403907299500
Aure	8.38931E-14	-0.3279403907467740
Tustna	8.38931E-14	-0.3279403907467740
Meløy	7.62017E-14	-0.3279403907579590
Oppdal	6.45479E-14	-0.3279403907749060
Norddal	6.38871E-14	-0.3279403907758670
Sømna	6.18656E-14	-0.3279403907788070
Nes	5.29271E-14	-0.3279403907918060
Namsskogan	3.24185E-14	-0.3279403908216290
Øystre Slidre	2.75301E-14	-0.3279403908287380
Holtålen	2.28148E-14	-0.3279403908355950
Hamarøy	2.26122E-14	-0.3279403908358900
Unjárga Nesseby	2.0475E-14	-0.3279403908389980
Vestre Slidre	1.23701E-14	-0.3279403908507840
Træna	1.22085E-14	-0.3279403908510190
Målselv	1.11824E-14	-0.3279403908525120
Roan	1.08852E-14	-0.3279403908529440
Lenvik	5.78314E-15	-0.3279403908603630
Lierne	5.25267E-15	-0.3279403908611350
Nordreisa	3.49804E-15	-0.3279403908636860
Gol	3.15477E-15	-0.3279403908641850
Fyresdal	1.21108E-15	-0.3279403908670120
Hitra	1.20612E-15	-0.3279403908670190
Andøy	7.42135E-16	-0.3279403908676940
Røyrvik	5.70484E-16	-0.3279403908679440
Vågå	5.2887E-16	-0.3279403908680040
Deatnu Tana	3.98202E-16	-0.3279403908681940
Rødøy	3.83866E-16	-0.3279403908682150

Municipality	Beds per residents adjusted *km*	Standardized Index
Alta	3.72807E-16	-0.3279403908682310
Dovre	3.61674E-16	-0.3279403908682470
Porsanger Porsángu Porsanki	1.8887E-16	-0.3279403908684990
Vang	9.78109E-17	-0.3279403908686310
Årdal	9.62755E-17	-0.3279403908686330
Skjervøy	3.31141E-17	-0.3279403908687250
Røros	3.23031E-17	-0.3279403908687260
Ål	2.81254E-17	-0.3279403908687320
Frøya	1.21237E-17	-0.3279403908687560
Engerdal	5.36509E-18	-0.3279403908687650
Hemsedal	3.17933E-18	-0.3279403908687690
Måsøy	2.2279E-18	-0.3279403908687700
Valle	1.86372E-18	-0.3279403908687700
Lesja	8.11186E-19	-0.3279403908687720
Berg	7.12389E-19	-0.3279403908687720
Lom	6.38102E-19	-0.3279403908687720
Torsken	6.19435E-19	-0.3279403908687720
Hol	4.94936E-19	-0.3279403908687720
Vadsø	3.63114E-19	-0.3279403908687730
Nordkapp	1.90341E-19	-0.3279403908687730
Bindal	1.05686E-19	-0.3279403908687730
Skjåk	5.90567E-20	-0.3279403908687730
Bykle	8.08759E-21	-0.3279403908687730
Kvænangen	2.90872E-21	-0.3279403908687730
Steigen	5.47338E-22	-0.3279403908687730
Kárásjohka Karasjok	3.50428E-23	-0.3279403908687730
Båtsfjord	6.58673E-25	-0.3279403908687730
Hasvik	4.38924E-25	-0.3279403908687730
Vardø	9.46538E-26	-0.3279403908687730
Loppa	2.13577E-27	-0.3279403908687730
Berlevåg	1.11653E-27	-0.3279403908687730
Guovdageaidnu Kautokeino	1.06644E-27	-0.3279403908687730
Gamvik	1.02356E-32	-0.3279403908687730
Lebesby	3.20998E-33	-0.3279403908687730

Appendix G: Accessibility indices for physician man labor years adjusted for distance in time

The table below shows the *phycisian man-labor years per resident adjusted for time* and *standardized index* for all of the 430 municipalities in Norway

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Oslo	0.006163666	11.775561
Lillehammer	0.002392385	2.877092
Øyer	0.002254469	2.551674
Gausdal	0.002166749	2.344695
Drammen	0.002079748	2.139415
Lier	0.002025777	2.012067
Ringebu	0.001980259	1.904666
Nedre Eiker	0.001970442	1.881502
Røyken	0.00194958	1.832279
Hamar	0.001938564	1.806286
Elverum	0.001930037	1.786166
Løten	0.001925229	1.77482
Stange	0.001895338	1.704292
Skien	0.001864159	1.630724
Hurum	0.00184734	1.59104
Sør-Fron	0.001845803	1.587413
Ringsaker	0.00183856	1.570321
Ålesund	0.001817288	1.52013
Lærdal	0.001814051	1.512493
Siljan	0.001803	1.486417
Porsgrunn	0.001802927	1.486244
Nord-Fron	0.001791813	1.46002
Haugesund	0.001784107	1.441838
Utsira	0.001766496	1.400285
Oppegård	0.001765202	1.397231
Ullensaker	0.001759955	1.384851
Bergen	0.001750459	1.362444
Lørenskog	0.001739855	1.337424
Tysvær	0.00170585	1.257188
Sveio	0.001703048	1.250578
Ski	0.00170165	1.247278
Tromsø	0.001694025	1.229287
Skedsmo	0.001682923	1.203091
Rælingen	0.001677322	1.189876

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Bodø	0.0016722	1.177791
Nannestad	0.00166855	1.169177
Vestby	0.001667955	1.167774
Frogn	0.001662404	1.154677
Bamble	0.001662308	1.154451
Åmot	0.001662198	1.15419
Karmøy	0.001659365	1.147505
Ås	0.001651358	1.128614
Odda	0.001646944	1.118199
Våler	0.001646103	1.116214
Nittedal	0.001635917	1.09218
Fet	0.001633185	1.085733
Gjerdrum	0.001621387	1.057896
Hurdal	0.00161589	1.044924
Eidsvoll	0.001613848	1.040107
Sørum	0.001605254	1.01983
Åsnes	0.001603886	1.016601
Meland	0.001601026	1.009852
Lindås	0.001595846	0.997631
Nesodden	0.001591905	0.988332
Sel	0.001573382	0.944627
Trysil	0.001565139	0.925175
Kragerø	0.001551082	0.892007
Sogndal	0.001539574	0.864854
Enebakk	0.001529334	0.840692
Bokn	0.00151735	0.812416
Aurland	0.001504643	0.782434
Molde	0.001504471	0.782028
Drangedal	0.001496264	0.762663
Radøy	0.001478002	0.719573
Vindafjord	0.001476339	0.715649
Ølen	0.001476339	0.715649
Osterøy	0.001474574	0.711485
Aurskog-Høland	0.001472849	0.707415
Stavanger	0.001466193	0.691709
Sarpsborg	0.001462649	0.683348
Kristiansand	0.001462186	0.682256
Tynset	0.00145759	0.67141
Fauske	0.00145656	0.668979
Råde	0.001454282	0.663604
Leikanger	0.001450909	0.655647
Levanger	0.001449892	0.653246
Ullensvang	0.001449111	0.651403

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Samnanger	0.001443969	0.639271
Tønsberg	0.001442244	0.6352
Kristiansund	0.001437699	0.624476
Frei	0.001437699	0.624476
Fredrikstad	0.001435533	0.619367
Moss	0.001434923	0.617927
Rygge	0.001433109	0.613646
Etne	0.001426685	0.598488
Kvitsøy	0.001421931	0.587272
Verdal	0.001410259	0.559732
Voss	0.001408595	0.555805
Nøtterøy	0.001406189	0.550127
Sandnes	0.001405762	0.549119
Songdalen	0.001402772	0.542066
Søgne	0.001401047	0.537996
Stokke	0.001400977	0.53783
Randaberg	0.001400184	0.535958
Andebu	0.001399186	0.533604
Vågå	0.001395904	0.525859
Horten	0.001393397	0.519945
Vestnes	0.001393296	0.519707
Stjørdal	0.001393283	0.519677
Fræna	0.001392113	0.516916
Re	0.001391043	0.51439
Lardal	0.001388186	0.507649
Våler	0.001387557	0.506166
Dovre	0.001386193	0.502947
Ringerike	0.001385755	0.501913
Skiptvet	0.001385415	0.50111
Holmestrand	0.001384241	0.498342
Austrheim	0.001382681	0.49466
Luster	0.001381775	0.492523
Halden	0.001377793	0.483128
Sørfold	0.001377768	0.483067
Midsund	0.001372517	0.470678
Sola	0.001371719	0.468795
Larvik	0.001369558	0.463695
Vennesla	0.001369296	0.463077
Gjemnes	0.001367108	0.457916
Gjesdal	0.001360774	0.442971
Rakkestad	0.001359643	0.440301
Sande	0.001355535	0.430609
Hof	0.001355317	0.430094

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Rennesøy	0.001354556	0.428298
Sandefjord	0.001354264	0.427609
Saltdal	0.00135311	0.424886
Inderøy	0.001352329	0.423044
Hole	0.001350654	0.419092
Alvdal	0.001349118	0.415468
Malvik	0.001348027	0.412893
Askim	0.001346008	0.408128
Klepp	0.001345584	0.407129
Jondal	0.001340708	0.395624
Aukra	0.001336654	0.386057
Vaksdal	0.001333057	0.377571
Tolga	0.001331441	0.373757
Spydeberg	0.001330877	0.372426
Eide	0.001330797	0.372237
Tjøme	0.001328139	0.365967
Fedje	0.001328038	0.365727
Trondheim	0.001327411	0.364249
Eidsberg	0.001316934	0.339527
Karlsøy	0.001316665	0.338893
Rømskog	0.001315938	0.337179
Steinkjer	0.001314351	0.333433
Frosta	0.001313702	0.331901
Eidfjord	0.0013137	0.331897
Time	0.001311442	0.326568
Balestrand	0.001308246	0.319029
Mandal	0.00130648	0.314862
Hobøl	0.001305791	0.313234
Gjøvik	0.001296894	0.292243
Trøgstad	0.001286062	0.266684
Balsfjord	0.001285554	0.265485
Granvin	0.001284541	0.263095
Lindesnes	0.001280181	0.252808
Marnardal	0.001278236	0.248218
Arendal	0.001276262	0.243562
Kongsberg	0.001268579	0.225432
Mosvik	0.001268352	0.224898
Suldal	0.001267786	0.223561
Svelvik	0.001260457	0.206269
Rauma	0.001257026	0.198172
Melhus	0.001252627	0.187794
Storfjord	0.001245738	0.171539
Bjerkreim	0.001244095	0.167662

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Finnøy	0.001236511	0.149766
Nissedal	0.001236395	0.149494
Lesja	0.001235106	0.146452
Vefsn	0.001231135	0.137083
Verran	0.001230388	0.135319
Nesset	0.00122806	0.129826
Namdalseid	0.001228003	0.129692
Østre Toten	0.001227178	0.127744
Alstahaug	0.001225087	0.122812
Ulvik	0.001224415	0.121226
Leirfjord	0.001221751	0.114941
Hå	0.001220711	0.112486
Vestre Toten	0.00122034	0.11161
Masfjorden	0.001217954	0.105982
Lom	0.001217592	0.105127
Modum	0.001216746	0.103132
Aremark	0.001215507	0.100207
Skaun	0.00121532	0.099767
Lyngdal	0.00121525	0.099601
Marker	0.001214979	0.098961
Klæbu	0.001214968	0.098935
Forsand	0.001214832	0.098613
Tingvoll	0.001214531	0.097905
Rana	0.001210937	0.089424
Sauda	0.001210457	0.088293
Nes	0.001206908	0.079918
Hvaler	0.001206895	0.079886
Nesna	0.001206548	0.079069
Bærum	0.001205549	0.076711
Audnedal	0.001204408	0.07402
Froland	0.001201902	0.068106
Os	0.001198621	0.060365
Tvedestrand	0.001198611	0.060342
Øvre Eiker	0.001198475	0.060019
Sunndal	0.001197456	0.057616
Beiarn	0.001197019	0.056583
Halsa	0.001195402	0.052768
Lyngen	0.001194177	0.049879
Selbu	0.001194004	0.049469
Målselv	0.001189991	0.040001
Gildeskål	0.001189779	0.039502
Grimstad	0.001187657	0.034493
Leksvik	0.001184457	0.026944

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Hemnes	0.001182157	0.021516
Asker	0.001179649	0.015598
Søndre Land	0.001179266	0.014695
Rendalen	0.001172697	-0.000805
Orkdal	0.001167735	-0.012512
Averøy	0.00116713	-0.013939
Kvam	0.001164387	-0.020411
Strand	0.001162538	-0.024774
Skjåk	0.001162076	-0.025864
Skodje	0.001161046	-0.028295
Haram	0.001159768	-0.031312
Kongsvinger	0.001159178	-0.032702
Krødsherad	0.001158882	-0.033401
Folldal	0.001157829	-0.035885
Ørskog	0.001155495	-0.041393
Kvinesdal	0.001153781	-0.045438
Stord	0.001151673	-0.050411
Eigersund	0.001144543	-0.067234
Vegårshei	0.00114188	-0.073518
Namsos	0.001139907	-0.078173
Midtre Gauldal	0.001137399	-0.084092
Flesberg	0.001136854	-0.085377
Gran	0.001135522	-0.08852
Surnadal	0.001123727	-0.116351
Bardu	0.001121997	-0.120434
Fyresdal	0.001121376	-0.121899
Meråker	0.001120484	-0.124002
Sandøy	0.001119515	-0.12629
Lillesand	0.001119028	-0.127437
Stordal	0.001118092	-0.129648
Risør	0.001112562	-0.142696
Lavangen	0.001108974	-0.151161
Nordre Land	0.001106465	-0.157082
Hægebostad	0.001106107	-0.157925
Åseral	0.001103628	-0.163775
Smøla	0.001103558	-0.16394
Sør-Odal	0.001101478	-0.168848
Eid	0.001094598	-0.185082
Førde	0.001092934	-0.189009
Lunner	0.00109286	-0.189184
Snillfjord	0.001092044	-0.191109
Snåsa	0.001088477	-0.199525
Flekkefjord	0.001087926	-0.200825

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Rindal	0.001080556	-0.218213
Farsund	0.001078965	-0.221967
Gjerstad	0.001076842	-0.226977
Birkenes	0.001071573	-0.239411
Sørreisa	0.001065748	-0.253155
Meløy	0.001062486	-0.260851
Tysnes	0.001062117	-0.261722
Stor-Elvdal	0.00106153	-0.263106
Sula	0.001057509	-0.272595
Dønna	0.001054959	-0.278611
Ibestad	0.001054476	-0.279751
Hjelmeland	0.001051104	-0.287707
Sykkylven	0.001049222	-0.292149
Gaular	0.001047923	-0.295212
Jevnaker	0.001045019	-0.302065
Lenvik	0.001043561	-0.305506
Modalen	0.001042316	-0.308442
Overhalla	0.001041804	-0.309651
Askøy	0.001041324	-0.310783
Åmli	0.001040781	-0.312065
Eidskog	0.001040674	-0.312317
Lund	0.001038834	-0.316658
Grong	0.001038766	-0.316818
Fjell	0.001038003	-0.318619
Gáivuotna Kåfjord	0.001036496	-0.322176
Osen	0.001035962	-0.323436
Norddal	0.001035396	-0.324771
Giske	0.001034831	-0.326104
Nord-Odal	0.001034084	-0.327867
Gratangen	0.001032456	-0.331708
Sokndal	0.001031016	-0.335105
Fitjar	0.001030074	-0.337328
Meldal	0.001027706	-0.342915
Tydal	0.001024489	-0.350505
Tranøy	0.001022667	-0.354807
Agdenes	0.001022031	-0.356307
Gloppen	0.001021067	-0.358581
Rissa	0.001020587	-0.359713
Bømlo	0.001019209	-0.362965
Naustdal	0.001018899	-0.363697
Evenes	0.001016461	-0.369449
Fosnes	0.001014698	-0.373608
Stranda	0.001006011	-0.394105

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Grue	0.001001808	-0.404023
Rennebu	0.000993969	-0.42252
Salangen	0.000993453	-0.423736
Rollag	0.000992752	-0.425392
Etnedal	0.000991209	-0.429032
Flatanger	0.000991104	-0.42928
Vevelstad	0.000990963	-0.429613
Flå	0.000988289	-0.435921
Os	0.000985151	-0.443325
Dyrøy	0.00098515	-0.443328
Sigdal	0.000983664	-0.446834
Herøy	0.000983485	-0.447257
Ørsta	0.000980985	-0.453155
Sund	0.000980956	-0.453223
Engerdal	0.000977812	-0.460643
Høylandet	0.000975315	-0.466534
Narvik	0.000970035	-0.478993
Volda	0.000969359	-0.480589
Hareid	0.000969066	-0.481278
Fjaler	0.00096845	-0.482733
Sør-Aurdal	0.000966302	-0.4878
Hornindal	0.000961984	-0.49799
Sirdal	0.000961661	-0.498751
Ulstein	0.000960578	-0.501308
Hamarøy	0.000955482	-0.513331
Skånland	0.00095511	-0.514208
Harstad	0.000953133	-0.518874
Tinn	0.000940159	-0.549486
Stryn	0.000933669	-0.564799
Steigen	0.000933569	-0.565035
Hammerfest	0.000931101	-0.570858
Høyanger	0.000927361	-0.579683
Aure	0.000926544	-0.581612
Tustna	0.000926544	-0.581612
Lurøy	0.000923763	-0.588174
Grane	0.000918127	-0.601471
Bremanger	0.00091772	-0.602433
Evje og Hornnes	0.000914897	-0.609093
Tjeldsund	0.000914262	-0.610591
Iveland	0.000911411	-0.617318
Kvinnherad	0.000911118	-0.61801
Jølster	0.000908159	-0.624991
Oppdal	0.000907127	-0.627426

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Hemne	0.000901142	-0.641549
Nord-Aurdal	0.000899367	-0.645735
Moskenes	0.00089889	-0.646863
Notodden	0.00089604	-0.653586
Askvoll	0.000894347	-0.657581
Øygarden	0.000893418	-0.659773
Hattfjelldal	0.000893378	-0.659868
Hyllestad	0.00089183	-0.663519
Vågsøy	0.000884795	-0.68012
Kvæfjord	0.000874158	-0.705218
Ørland	0.000873825	-0.706003
Herøy	0.000868757	-0.717963
Nore og Uvdal	0.000865291	-0.72614
Holtålen	0.000865258	-0.726218
Flora	0.000861967	-0.733983
Selje	0.000861414	-0.735288
Kvalsund	0.000858477	-0.742217
Sande	0.000855185	-0.749984
Fusa	0.000854082	-0.752588
Åfjord	0.000852374	-0.756618
Flakstad	0.000849036	-0.764494
Bjugn	0.000848	-0.766939
Vestvågøy	0.000843728	-0.777018
Sortland	0.000840208	-0.785325
Gulen	0.000837501	-0.79171
Austevoll	0.000833791	-0.800466
Bjarkøy	0.000833077	-0.802149
Nordreisa	0.000829774	-0.809943
Torsken	0.000822826	-0.826338
Bygland	0.000820487	-0.831855
Øystre Slidre	0.000819816	-0.833438
Berg	0.000817886	-0.837993
Nes	0.000813933	-0.847321
Sauherad	0.000811955	-0.851987
Gol	0.000811224	-0.853712
Nærøy	0.00081115	-0.853887
Hadsel	0.000807824	-0.861735
Vik	0.000806261	-0.865424
Vestre Slidre	0.000803829	-0.871161
Hjartdal	0.000799239	-0.881992
Lierne	0.000798653	-0.883375
Lødingen	0.000796788	-0.887775
Vanylven	0.000790876	-0.901724

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Namsskogan	0.000788505	-0.907319
Ballangen	0.000788484	-0.907367
Bø	0.000781581	-0.923656
Nome	0.000775662	-0.937622
Hitra	0.000775337	-0.93839
Røros	0.000762556	-0.968546
Skjervøy	0.000751205	-0.995329
Vågan	0.000747939	-1.003037
Brønnøy	0.000744034	-1.01225
Roan	0.000736095	-1.030983
Vikna	0.000733508	-1.037087
Vinje	0.000733065	-1.038131
Ål	0.000732143	-1.040307
Vega	0.000726902	-1.052673
Vang	0.00072598	-1.054848
Røyrvik	0.000724409	-1.058557
Seljord	0.000718415	-1.072699
Øksnes	0.000718311	-1.072944
Frøya	0.000710716	-1.090865
Hemsedal	0.000705784	-1.102502
Bø	0.000705154	-1.10399
Tokke	0.000699896	-1.116394
Valle	0.000683975	-1.153961
Kviteseid	0.000683378	-1.155371
Tysfjord	0.000681756	-1.159197
Sømna	0.000664314	-1.200352
Årdal	0.000660731	-1.208806
Leka	0.000657191	-1.217158
Rødøy	0.000643756	-1.248858
Solund	0.0006435	-1.249463
Værøy	0.000643341	-1.249839
Alta	0.000639518	-1.258858
Porsanger Porsángu Porsanki	0.00062327	-1.297197
Hol	0.000619746	-1.305513
Bykle	0.000617659	-1.310435
Sør-Varanger	0.00060591	-1.338158
Kvænangen	0.000601046	-1.349634
Andøy	0.000552305	-1.464641
Måsøy	0.000526197	-1.526245
Kárásjohka Karasjok	0.000513261	-1.556767
Træna	0.000508188	-1.568737
Nordkapp	0.000500134	-1.58774
Unjárga Nesseby	0.000492297	-1.606232

Municipality	Physician man-labor years per resident adjusted *time*	Standardized index
Deatnu Tana	0.000484841	-1.623825
Bindal	0.000483694	-1.626532
Loppa	0.000457031	-1.689443
Røst	0.000427227	-1.759766
Guovdageaidnu Kautokeino	0.000414089	-1.790766
Vadsø	0.000398046	-1.828621
Hasvik	0.000340205	-1.965099
Gamvik	0.000328522	-1.992665
Båtsfjord	0.000323965	-2.003416
Lebesby	0.000317206	-2.019366
Vardø	0.000295473	-2.070645
Berlevåg	0.000286539	-2.091726

Appendix H: Accessibility indices for physician man labor years adjusted for distance in km

The table below shows the *phycisian man-labor years per resident adjusted for km* and *standardized index* for all of the 430 municipalities in Norway

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Oslo	0.004895274	11.8719457638756000
Lillehammer	0.002169259	5.0845669353241000
Drammen	0.001748044	4.0358011577129200
Bergen	0.00172743	3.9844758169213100
Skien	0.00157592	3.6072379367681600
Haugesund	0.001518964	3.4654269727766600
Tromsø	0.001515284	3.4562626646805300
Bodø	0.001449057	3.2913673222632100
Ålesund	0.001445417	3.2823044470272900
Lørenskog	0.001399069	3.1669042952352200
Odda	0.001369863	3.0941868428516300
Tynset	0.001343033	3.0273840656162200
Trondheim	0.001306434	2.9362585167493000
Stavanger	0.001283813	2.8799356955576600
Kristiansand	0.001206717	2.6879775673639100
Utsira	0.00119486	2.6584537416679300
Arendal	0.00109839	2.4182577928232400
Ringerike	0.001073326	2.3558517778740300
Gjøvik	0.001058386	2.3186549936652900
Voss	0.001044568	2.2842503562095300
Lærdal	0.001040042	2.2729796720352600
Kongsberg	0.000984931	2.1357612886698600
Førde	0.000946612	2.0403540973625400
Eid	0.000933251	2.0070864808940000
Molde	0.000922052	1.9792039616452400
Kongsvinger	0.000894706	1.9111160415884000
Hamar	0.000882713	1.8812548227543200
Elverum	0.000882713	1.8812548227448200
Bærum	0.000869056	1.8472498389771100

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Stord	0.000826009	1.7400697802858700
Hammerfest	0.000786912	1.6427249205378300
Tinn	0.000748752	1.5477112832793500
Levanger	0.000744093	1.5361098262678600
Tønsberg	0.000727812	1.4955724101130000
Notodden	0.000643627	1.2859644243922100
Alstahaug	0.000559023	1.0753130490930600
Rana	0.000546022	1.0429425990116500
Kristiansund	0.000503714	0.9376023008377600
Frei	0.000503714	0.9376023008377600
Sør-Varanger	0.000483192	0.8865050187581290
Fredrikstad	0.000482075	0.8837241108746290
Vefsn	0.000390016	0.6545113688744290
Harstad	0.000386637	0.6460964343916150
Namsos	0.000382102	0.6348050065794500
Sarpsborg	0.000353222	0.5629000549332670
Larvik	0.000304081	0.4405452008176190
Porsgrunn	0.000293713	0.4147306905507460
Volda	0.000281476	0.3842616716670480
Skedsmo	0.000256948	0.3231906657719820
Lier	0.000251318	0.3091739599147720
Kvitsøy	0.000249034	0.3034866192115650
Nøtterøy	0.00022361	0.2401837077157630
Hadsel	0.000211321	0.2095857343337490
Moss	0.000190529	0.1578170253379680
Sandefjord	0.000183924	0.1413725140828670
Halden	0.000183786	0.1410285098122040
Rælingen	0.000165622	0.0958014423950938
Narvik	0.000163368	0.0901892539154678
Vestvågøy	0.000158491	0.0780462789022925
Flekkefjord	0.000154555	0.0682470714546464
Asker	0.000129247	0.0052339616013712
Nedre Eiker	0.000122278	-0.0121172345049268
Randaberg	0.000118818	-0.0207334554263840
Vestnes	0.00011752	-0.0239652983505481
Lardal	0.000115218	-0.0296961323606564

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Hole	0.000103451	-0.0589939998328010
Songdalen	0.000103096	-0.0598785442743235
Askim	9.47796E-05	-0.0805846600598847
Naustdal	9.3027E-05	-0.0849485095149979
Rygge	8.47749E-05	-0.1054950436420440
Vestre Toten	8.18183E-05	-0.1128565512742360
Siljan	8.16625E-05	-0.1132445166612720
Tysvær	8.03011E-05	-0.1166339607440380
Askøy	7.85604E-05	-0.1209681139866310
Søgne	6.50827E-05	-0.1545256550651130
Sandnes	6.39173E-05	-0.1574273456677740
Stange	6.24231E-05	-0.1611477545809330
Løten	6.10495E-05	-0.1645678624196300
Oppegård	6.09073E-05	-0.1649217368856090
Froland	5.80672E-05	-0.1719933225711390
Verdal	5.63829E-05	-0.1761869649565010
Fjell	5.5917E-05	-0.1773469870814440
Røyken	5.3962E-05	-0.1822145462041870
Sveio	5.38275E-05	-0.1825495563130950
Kragerø	5.00425E-05	-0.1919735324681990
Stokke	4.85124E-05	-0.1957833718376480
Vennesla	4.82145E-05	-0.1965251406078570
Øyer	4.30405E-05	-0.2094075864276420
Ørsta	4.21E-05	-0.2117493585193230
Fet	4.08779E-05	-0.2147922165213380
Karmøy	3.46669E-05	-0.2302566999538600
Andebu	3.23344E-05	-0.2360641880879840
Ringsaker	2.61884E-05	-0.2513668414371530
Melhus	2.54078E-05	-0.2533103493892200
Råde	2.46086E-05	-0.2553002203467840
Dønna	2.23358E-05	-0.2609592489192890
Nittedal	2.22021E-05	-0.2612920602745400
Gjerdrum	2.11225E-05	-0.2639801113380380
Østre Toten	1.86249E-05	-0.2701987612161370
Gaular	1.84099E-05	-0.2707340909287450
Aukra	1.79323E-05	-0.2719233523501480

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Herøy	1.79249E-05	-0.2719417429430780
Spydeberg	1.67124E-05	-0.2749606626086450
Horten	1.6618E-05	-0.2751955920379800
Sola	1.64051E-05	-0.2757258820024490
Tolga	1.32326E-05	-0.2836247795947810
Gloppen	1.29187E-05	-0.2844064772016210
Grimstad	1.24485E-05	-0.2855771406524380
Fræna	1.22632E-05	-0.2860385395399220
Klæbu	1.21224E-05	-0.2863890372657460
Kvæfjord	1.14442E-05	-0.2880776529056660
Leirfjord	1.13345E-05	-0.2883508172587180
Alvdal	1.12761E-05	-0.2884962452149600
Våler	1.05507E-05	-0.2903024256004790
Tjøme	1.05274E-05	-0.2903604380006250
Gausdal	9.99556E-06	-0.2916846108262270
Re	9.89216E-06	-0.2919420679185290
Meland	9.34078E-06	-0.2933149160465780
Rennesøy	9.18517E-06	-0.2937023682547790
Øvre Eiker	8.78234E-06	-0.2947053608942930
Sør-Odal	8.64088E-06	-0.2950575571771950
Flesberg	7.7879E-06	-0.2971813653084620
Ski	7.76288E-06	-0.2972436571865830
Eidsberg	7.50531E-06	-0.2978849672644850
Granvin	7.32548E-06	-0.2983327175224790
Sørum	6.90153E-06	-0.2993882945414000
Lindås	6.51684E-06	-0.3003461126521700
Klepp	6.40827E-06	-0.3006164288853160
Skiptvet	5.84337E-06	-0.3020229504247450
Tvedestrand	5.48272E-06	-0.3029209374915600
Sauherad	5.40389E-06	-0.3031172027248290
Trøgstad	5.32165E-06	-0.3033219697027030
Gjesdal	4.74737E-06	-0.3047518475214020
Hurum	4.43538E-06	-0.3055286516832780
Os	3.68352E-06	-0.3074006777369630
Malvik	3.47483E-06	-0.3079202691147630
Holmestrand	3.42553E-06	-0.3080430278921530

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Sund	3.40031E-06	-0.3081058100132800
Skaun	3.30375E-06	-0.3083462541275680
Bamble	3.26876E-06	-0.3084333644806430
Bømlo	2.55131E-06	-0.3102197167586200
Inderøy	2.48971E-06	-0.3103730854125450
Overhalla	2.47363E-06	-0.3104131217801920
Ullensaker	2.43841E-06	-0.3105008042868070
Tysnes	2.43218E-06	-0.3105163368162860
Osterøy	2.2578E-06	-0.3109505109081120
Rakkestad	2.12518E-06	-0.3112807077035460
Enebakk	2.02954E-06	-0.3115188274329330
Time	2.00891E-06	-0.3115702160264340
Søndre Land	1.86731E-06	-0.3119227605156220
Kvinesdal	1.75164E-06	-0.3122107621020480
Bjarkøy	1.7117E-06	-0.3123102229444260
Eidskog	1.67614E-06	-0.3123987444233650
Hvaler	1.64305E-06	-0.3124811353028490
Hjartdal	1.59539E-06	-0.3125998068167670
Hobøl	1.53938E-06	-0.3127392675442000
Frogn	1.33556E-06	-0.3132467387918890
Kvalsund	1.25623E-06	-0.3134442628603460
Ås	1.16108E-06	-0.3136811695488280
Midsund	1.1363E-06	-0.3137428730667020
Sogndal	1.13544E-06	-0.3137450298632230
Hornindal	1.08185E-06	-0.3138784448950690
Modum	9.78813E-07	-0.3141349962880570
Stjørdal	9.51886E-07	-0.3142020404569480
Austevoll	9.08344E-07	-0.3143104533892990
Vestby	8.77528E-07	-0.3143871812079670
Grue	7.23609E-07	-0.3147704176108060
Ulvik	6.77978E-07	-0.3148840325411490
Flakstad	6.7426E-07	-0.3148932887962040
Våler	6.72243E-07	-0.3148983102950540
Fosnes	5.86071E-07	-0.3151128653466640
Vaksdal	5.68313E-07	-0.3151570804017660
Eide	5.30785E-07	-0.3152505200363830

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Åmot	5.29481E-07	-0.3152537670819240
Finnøy	5.26023E-07	-0.3152623766560970
Fitjar	5.04067E-07	-0.3153170448530110
Ullensvang	4.87954E-07	-0.3153571632746580
Sortland	4.73964E-07	-0.3153919952927350
Gjemnes	4.25965E-07	-0.3155115067920200
Bø	4.01366E-07	-0.3155727545145470
Nesna	3.87108E-07	-0.3156082564385490
Hof	3.80315E-07	-0.3156251698458500
Aurland	3.48895E-07	-0.3157033998678110
Vegårshei	3.47011E-07	-0.3157080916392210
Lillesand	3.47011E-07	-0.3157080916392210
Mandal	3.12169E-07	-0.3157948436122680
Rissa	2.93774E-07	-0.3158406423932990
Fjaler	2.5999E-07	-0.3159247595159210
Bokn	2.5815E-07	-0.3159293429298390
Kvinnherad	2.50736E-07	-0.3159478015672730
Orkdal	2.50338E-07	-0.3159487926049050
Mosvik	2.44673E-07	-0.3159628988162350
Aurskog-Høland	2.16663E-07	-0.3160326381985580
Nesodden	2.07911E-07	-0.3160544303399450
Sande	2.02678E-07	-0.3160674585596220
Nannestad	1.88092E-07	-0.3161037758940170
Hemnes	1.71597E-07	-0.3161448456562870
Tjeldsund	1.68215E-07	-0.3161532679158860
Nord-Odal	1.61465E-07	-0.3161700741184950
Sandøy	1.60482E-07	-0.3161725212011630
Frosta	1.57865E-07	-0.3161790369703190
Ulstein	1.49576E-07	-0.3161996763112560
Steinkjer	1.48507E-07	-0.3162023365537620
Radøy	1.45787E-07	-0.3162091098997190
Nordre Land	1.35946E-07	-0.3162336126611710
Skånland	1.32323E-07	-0.3162426324833030
Os	1.30378E-07	-0.3162474745034320
Nes	1.29927E-07	-0.3162485993574460
Aremark	1.25629E-07	-0.3162593003245890

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Nome	1.20889E-07	-0.3162711013235450
Forsand	1.08348E-07	-0.3163023277869680
Marnardal	1.06057E-07	-0.3163080301135740
Namdalseid	9.15133E-08	-0.3163442429519630
Krødsherad	8.87904E-08	-0.3163510226490010
Samnanger	8.66732E-08	-0.3163562939979550
Moskenes	7.9124E-08	-0.3163750904969920
Stryn	7.56736E-08	-0.3163836814852070
Åsnes	7.01919E-08	-0.3163973300773390
Bremanger	6.44848E-08	-0.3164115399942400
Jølster	6.41128E-08	-0.3164124660763850
Marker	6.39308E-08	-0.3164129192695460
Hå	5.27385E-08	-0.3164407865911580
Midtre Gauldal	5.15634E-08	-0.3164437123794330
Vindafjord	4.53105E-08	-0.3164592811330920
Ølen	4.53105E-08	-0.3164592811330920
Bjerkreim	4.31786E-08	-0.3164645892587070
Vanylven	3.83902E-08	-0.3164765117441320
Risør	3.69422E-08	-0.3164801169155550
Lindesnes	3.57017E-08	-0.3164832056948180
Audnedal	3.19558E-08	-0.3164925323999220
Øygarden	3.09268E-08	-0.3164950944769590
Drangedal	2.59773E-08	-0.3165074179433540
Birkenes	2.42728E-08	-0.3165116620213820
Ringebu	2.28716E-08	-0.3165151507431430
Hjelmeland	2.27678E-08	-0.3165154093179140
Hareid	2.23718E-08	-0.3165163951552580
Leikanger	1.70265E-08	-0.3165297041965130
Fusa	1.59846E-08	-0.3165322984860400
Sigdal	1.58053E-08	-0.3165327449139290
Grong	1.33757E-08	-0.3165387940887660
Ballangen	1.32468E-08	-0.3165391150507700
Vågsøy	1.27615E-08	-0.3165403235465860
Fauske	1.27614E-08	-0.3165403237405840
Værøy	1.25174E-08	-0.3165409312914140
Rauma	1.18741E-08	-0.3165425329763810

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Strand	1.17675E-08	-0.3165427982386970
Gran	1.1724E-08	-0.3165429067438520
Lyngdal	1.11013E-08	-0.3165444572137900
Nesset	1.05314E-08	-0.3165458761625180
Ibestad	1.04374E-08	-0.3165461102284630
Eidsvoll	9.5745E-09	-0.3165482586130120
Høylandet	9.52045E-09	-0.3165483931882630
Karlsøy	9.12587E-09	-0.3165493756281190
Rendalen	8.58865E-09	-0.3165507132355940
Høyanger	8.17144E-09	-0.3165517520242000
Sande	7.15493E-09	-0.3165542829731460
Flora	7.10391E-09	-0.3165544100204470
Askvoll	6.96324E-09	-0.3165547602601570
Lunner	6.03533E-09	-0.3165570706233460
Austrheim	5.82492E-09	-0.3165575945104890
Herøy	5.74197E-09	-0.3165578010487110
Leksvik	5.73857E-09	-0.3165578095148250
Snillfjord	5.38067E-09	-0.3165587006381440
Åmli	5.30875E-09	-0.3165588797061750
Hurdal	5.18319E-09	-0.3165591923310090
Gjerstad	5.10059E-09	-0.3165593979915020
Rollag	5.05474E-09	-0.3165595121444060
Luster	5.02674E-09	-0.3165595818656410
Etne	4.92114E-09	-0.3165598448017390
Svelvik	4.33131E-09	-0.3165613133815010
Gratangen	4.1533E-09	-0.3165617566022030
Evenes	4.02599E-09	-0.3165620735934740
Selje	3.92132E-09	-0.3165623341848550
Vågan	3.73517E-09	-0.3165627976896540
Vevelstad	2.59602E-09	-0.3165656340057920
Grane	2.34891E-09	-0.3165662492698640
Folldal	2.16072E-09	-0.3165667178345570
Verran	2.05112E-09	-0.3165669907297630
Vinje	1.87042E-09	-0.3165674406358730
Sula	1.66163E-09	-0.3165679604815180
Seljord	1.21516E-09	-0.3165690721433470

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Jondal	1.09877E-09	-0.3165693619400820
Nærøy	1.0549E-09	-0.3165694711737650
Rømskog	8.86282E-10	-0.3165698909960060
Sør-Fron	8.43577E-10	-0.3165699973250840
Jevnaker	8.39003E-10	-0.3165700087151620
Fedje	8.37064E-10	-0.3165700135425860
Sykkylven	7.77091E-10	-0.3165701628656200
Masfjorden	5.72436E-10	-0.3165706724282020
Etnedal	5.33795E-10	-0.3165707686389510
Lavangen	5.10871E-10	-0.3165708257152900
Kvam	4.95991E-10	-0.3165708627652290
Selbu	4.94186E-10	-0.3165708672574360
Vega	4.83814E-10	-0.3165708930822630
Trysil	4.63363E-10	-0.3165709440032370
Eidfjord	4.44957E-10	-0.3165709898325790
Farsund	4.29495E-10	-0.3165710283289670
Salangen	4.08713E-10	-0.3165710800730010
Hægebostad	4.03075E-10	-0.3165710941116780
Sørfold	3.09259E-10	-0.3165713277002370
Eigersund	2.90935E-10	-0.3165713733233360
Agdenes	2.52287E-10	-0.3165714695517780
Averøy	2.50163E-10	-0.3165714748402330
Meldal	2.37595E-10	-0.3165715061328400
Røst	2.15797E-10	-0.3165715604057000
Øksnes	2.14624E-10	-0.3165715633271270
Sør-Aurdal	2.08515E-10	-0.3165715785375550
Lyngen	1.39612E-10	-0.3165717500956450
Lødingen	1.36046E-10	-0.3165717589739440
Kviteseid	1.24291E-10	-0.3165717882419380
Hyllestad	1.13115E-10	-0.3165718160691780
Sirdal	1.09521E-10	-0.3165718250173310
Balestrand	1.08043E-10	-0.3165718286990200
Nord-Fron	1.03301E-10	-0.3165718405039970
Åseral	8.75761E-11	-0.3165718796577900
Evje og Hornnes	8.45304E-11	-0.3165718872412740
Saltdal	8.2614E-11	-0.3165718920129020

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Tingvoll	7.38557E-11	-0.3165719138197590
Snåsa	7.33147E-11	-0.3165719151666420
Hattfjelldal	6.41805E-11	-0.3165719379095990
Suldal	6.41545E-11	-0.3165719379742010
Flatanger	6.16345E-11	-0.3165719442486270
Gáivuotna Kåfjord	4.83694E-11	-0.3165719772767120
Modalen	4.52538E-11	-0.3165719850341720
Osen	3.89216E-11	-0.3165720008004560
Flå	3.22666E-11	-0.3165720173704090
Meråker	3.18306E-11	-0.3165720184560930
Tokke	3.16241E-11	-0.3165720189702660
Brønnøy	2.45743E-11	-0.3165720365232090
Giske	2.44238E-11	-0.3165720368979140
Halsa	2.40979E-11	-0.3165720377094280
Skodje	2.39695E-11	-0.3165720380290010
Tysfjord	2.1193E-11	-0.3165720449422100
Dyrøy	2.07666E-11	-0.3165720460038670
Bø	2.02648E-11	-0.3165720472530690
Rennebu	1.62903E-11	-0.3165720571492130
Ørskog	1.48593E-11	-0.3165720607119710
Lurøy	1.45632E-11	-0.3165720614492360
Balsfjord	1.34485E-11	-0.3165720642247500
Gildeskål	1.23565E-11	-0.3165720669438120
Beiarn	1.21118E-11	-0.3165720675530150
Åfjord	1.18292E-11	-0.3165720682567080
Sunndal	1.14973E-11	-0.3165720690829670
Smøla	8.68948E-12	-0.3165720760740340
Storfjord	7.68191E-12	-0.3165720785827420
Vikna	6.05689E-12	-0.3165720826288000
Nore og Uvdal	5.09409E-12	-0.3165720850260310
Gulen	3.37949E-12	-0.3165720892951520
Tranøy	3.36384E-12	-0.3165720893341070
Ørland	2.91703E-12	-0.3165720904465910
Bardu	2.16337E-12	-0.3165720923230950
Iveland	2.00794E-12	-0.3165720927100940
Haram	1.7927E-12	-0.3165720932460240

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Nord-Aurdal	1.78606E-12	-0.3165720932625550
Lund	1.67046E-12	-0.3165720935503720
Sokndal	1.34058E-12	-0.3165720943717370
Rindal	1.19654E-12	-0.3165720947303800
Stor-Elvdal	1.1714E-12	-0.3165720947929740
Stranda	9.95682E-13	-0.3165720952304760
Vik	7.17776E-13	-0.3165720959224210
Sauda	6.9858E-13	-0.3165720959702180
Hemne	5.88939E-13	-0.3165720962432080
Bjugn	3.71788E-13	-0.3165720967838830
Tydal	2.12365E-13	-0.3165720971808230
Nissedal	2.02091E-13	-0.3165720972064020
Sørreisa	1.8893E-13	-0.3165720972391720
Stordal	1.81053E-13	-0.3165720972587840
Bygland	1.58359E-13	-0.3165720973152880
Sel	1.32344E-13	-0.3165720973800620
Surnadal	9.61224E-14	-0.3165720974702490
Solund	8.62803E-14	-0.3165720974947540
Aure	5.09015E-14	-0.3165720975828420
Tustna	5.09015E-14	-0.3165720975828420
Leka	5.08537E-14	-0.3165720975829620
Oppdal	4.37426E-14	-0.3165720976006670
Meløy	4.30316E-14	-0.3165720976024380
Norddal	3.52811E-14	-0.3165720976217350
Sømna	3.41054E-14	-0.3165720976246620
Nes	2.60961E-14	-0.3165720976446040
Namsskogan	1.72697E-14	-0.3165720976665810
Øystre Slidre	1.65729E-14	-0.3165720976683160
Holtålen	1.5461E-14	-0.3165720976710840
Unjárga Nesseby	1.1748E-14	-0.3165720976803290
Hamarøy	9.12642E-15	-0.3165720976868560
Målselv	8.99894E-15	-0.3165720976871740
Vestre Slidre	7.44667E-15	-0.3165720976910390
Roan	7.37667E-15	-0.3165720976912130
Træna	5.39744E-15	-0.3165720976961410
Lenvik	3.98613E-15	-0.3165720976996550

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Nordreisa	3.14755E-15	-0.3165720977017430
Lierne	2.79815E-15	-0.3165720977026130
Gol	1.55549E-15	-0.3165720977057070
Hitra	8.17359E-16	-0.3165720977075450
Vågå	3.21553E-16	-0.3165720977087790
Røyrvik	3.03903E-16	-0.3165720977088230
Fyresdal	2.44292E-16	-0.3165720977089720
Andøy	2.36134E-16	-0.3165720977089920
Deatnu Tana	2.28477E-16	-0.3165720977090110
Dovre	2.19898E-16	-0.3165720977090320
Alta	2.08333E-16	-0.3165720977090610
Rødøy	1.69727E-16	-0.3165720977091570
Porsanger Porsángu Porsanki	1.05545E-16	-0.3165720977093170
Vang	5.88812E-17	-0.3165720977094330
Årdal	5.16201E-17	-0.3165720977094510
Skjervøy	2.97961E-17	-0.3165720977095060
Røros	2.18911E-17	-0.3165720977095250
Ål	1.38675E-17	-0.3165720977095450
Frøya	8.21595E-18	-0.3165720977095590
Engerdal	3.71678E-18	-0.3165720977095710
Hemsedal	1.5676E-18	-0.3165720977095760
Måsøy	1.245E-18	-0.3165720977095770
Valle	9.1633E-19	-0.3165720977095780
Lesja	4.93201E-19	-0.3165720977095790
Berg	4.91009E-19	-0.3165720977095790
Torsken	4.26914E-19	-0.3165720977095790
Lom	3.87966E-19	-0.3165720977095790
Hol	2.44032E-19	-0.3165720977095790
Vadsø	2.08344E-19	-0.3165720977095790
Nordkapp	1.06367E-19	-0.3165720977095800
Bindal	5.82631E-20	-0.3165720977095800
Skjåk	3.59065E-20	-0.3165720977095800
Bykle	3.9764E-21	-0.3165720977095800
Kvænangen	2.61728E-21	-0.3165720977095800
Steigen	2.35547E-22	-0.3165720977095800
Kárásjohka Karasjok	1.95827E-23	-0.3165720977095800

Municipality	Physician man-labor years per residents adjusted *km*	Standardized Index
Båtsfjord	3.77927E-25	-0.3165720977095800
Hasvik	2.45281E-25	-0.3165720977095800
Vardø	5.43096E-26	-0.3165720977095800
Loppa	1.64695E-27	-0.3165720977095800
Berlevåg	6.40632E-28	-0.3165720977095800
Guovdageaidnu Kautokeino	5.95951E-28	-0.3165720977095800
Gamvik	5.87285E-33	-0.3165720977095800
Lebesby	1.84177E-33	-0.3165720977095800

Appendix I: Accessibility indices for contracted physician man labor years adjusted for distance in time

The table below shows the *Contracted physician man labor years per resident adjusted for time* and the *standardized index* for all of the 430 municipalities in Norway

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Oslo	0.000170121	2.210394
Bærum	0.000166208	2.122598
Asker	0.000165586	2.108632
Oppegård	0.000163543	2.062795
Lørenskog	0.000162922	2.048875
Skedsmo	0.000161015	2.006078
Nittedal	0.00016006	1.984661
Lier	0.000160036	1.984128
Rælingen	0.000159761	1.977956
Drammen	0.000159327	1.968217
Ski	0.000159095	1.963021
Vestby	0.000158656	1.953154
Frogn	0.000157003	1.916074
Røyken	0.00015654	1.905683
Gjerdrum	0.000156406	1.90267
Fet	0.000156068	1.895105
Sande	0.000156008	1.893742
Ullensaker	0.000155999	1.89355
Ås	0.000155966	1.892819
Sørum	0.000155293	1.877709
Moss	0.000154245	1.854197
Nedre Eiker	0.000153334	1.833748
Hole	0.00015313	1.829172
Holmestrand	0.000152523	1.815565
Hurum	0.000152411	1.813059
Rygge	0.000152106	1.806217
Svelvik	0.000151331	1.788817
Hof	0.0001504	1.767923
Enebakk	0.000150329	1.766334
Våler	0.000149621	1.75046
Re	0.00014961	1.750214
Nesodden	0.000148794	1.731899
Horten	0.000148566	1.726783

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Øvre Eiker	0.00014825	1.719689
Nannestad	0.00014822	1.719033
Spydeberg	0.000147828	1.710219
Råde	0.000147304	1.698461
Ringerike	0.000147173	1.69554
Hobøl	0.000146977	1.691146
Hurdal	0.000146255	1.674929
Tønsberg	0.000146072	1.670834
Nes	0.000145962	1.668361
Askim	0.000145389	1.655503
Lunner	0.000144969	1.64609
Eidsvoll	0.000144576	1.637269
Sarpsborg	0.000143632	1.616094
Andebu	0.000143381	1.610463
Jevnaker	0.000142501	1.590725
Nøtterøy	0.0001425	1.590688
Stokke	0.000142091	1.581514
Aurskog-Høland	0.000141523	1.56877
Gran	0.00014088	1.554348
Skiptvet	0.000140683	1.549928
Eidsberg	0.00014002	1.53506
Trøgstad	0.000139751	1.529009
Lardal	0.000139481	1.522964
Kongsberg	0.000139001	1.51218
Modum	0.000137144	1.470526
Larvik	0.000136657	1.459604
Fredrikstad	0.000136583	1.457951
Sør-Odal	0.000135512	1.43391
Sandefjord	0.000135195	1.426805
Rakkestad	0.000134915	1.420523
Nord-Odal	0.000134268	1.406011
Siljan	0.000133902	1.3978
Tjøme	0.00013368	1.39281
Stange	0.000131261	1.338535
Porsgrunn	0.000130946	1.331463
Halden	0.000130589	1.323463
Skien	0.000130298	1.316944
Løten	0.000128046	1.266406
Rømskog	0.000128025	1.265939
Marker	0.000127683	1.258259
Hamar	0.000127208	1.247599
Notodden	0.000126788	1.238184

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Krødsherad	0.000126062	1.221907
Kongsvinger	0.000125131	1.201011
Østre Toten	0.000124209	1.180313
Flesberg	0.000123951	1.174541
Bamble	0.000123583	1.166286
Ringsaker	0.000123187	1.157403
Elverum	0.000122933	1.151698
Søndre Land	0.000120445	1.095878
Sigdal	0.000120392	1.094691
Eidskog	0.000119528	1.075302
Nome	0.000119259	1.069266
Sauherad	0.000118454	1.051203
Vestre Toten	0.000118142	1.044201
Gjøvik	0.000117215	1.023416
Aremark	0.000116654	1.010833
Kragerø	0.000115961	0.995279
Bø	0.000115833	0.992401
Hvaler	0.000115153	0.97715
Hjartdal	0.000114724	0.967525
Lillehammer	0.000110608	0.875178
Nordre Land	0.000110352	0.869437
Grue	0.000110136	0.864593
Gjerstad	0.000109762	0.856189
Rollag	0.000109313	0.846128
Flå	0.000107798	0.812144
Drangedal	0.000107145	0.797474
Vegårshei	0.000106684	0.787132
Åmot	0.000106604	0.78535
Sør-Aurdal	0.000106539	0.783879
Seljord	0.000106518	0.783422
Tvedestrand	0.00010639	0.780541
Risør	0.000105748	0.766144
Våler	0.000105657	0.764106
Øyer	0.000105011	0.749604
Åsnes	0.000104332	0.73437
Kviteseid	0.000102211	0.686791
Gausdal	0.000101086	0.661546
Etnedal	0.000100578	0.650145
Arendal	0.00010026	0.643018
Trysil	9.99808E-05	0.63675
Froland	9.84797E-05	0.603073
Grimstad	9.70249E-05	0.570434

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Tinn	9.55631E-05	0.537637
Nord-Aurdal	9.55424E-05	0.537173
Nore og Uvdal	9.52723E-05	0.531113
Bergen	9.49762E-05	0.524469
Åmli	9.37237E-05	0.496369
Os	9.32125E-05	0.484901
Ringebu	9.25812E-05	0.470738
Lillesand	9.25373E-05	0.469752
Nissedal	9.08796E-05	0.432561
Gol	9.07716E-05	0.430138
Fjell	9.0315E-05	0.419894
Askøy	9.00912E-05	0.414873
Nes	8.96337E-05	0.404608
Tokke	8.92239E-05	0.395414
Birkenes	8.86724E-05	0.383042
Meland	8.7586E-05	0.358667
Lindås	8.74328E-05	0.35523
Kristiansand	8.73424E-05	0.353202
Øystre Slidre	8.73182E-05	0.352658
Vestre Slidre	8.67948E-05	0.340915
Sør-Fron	8.61195E-05	0.325766
Sund	8.58448E-05	0.319603
Vinje	8.5634E-05	0.314872
Stor-Elvdal	8.47258E-05	0.294497
Stord	8.42194E-05	0.283135
Tysnes	8.38067E-05	0.273876
Nord-Fron	8.38012E-05	0.273753
Songdalen	8.32553E-05	0.261505
Vennesla	8.32437E-05	0.261245
Søgne	8.30409E-05	0.256695
Fyresdal	8.28929E-05	0.253376
Ål	8.23208E-05	0.240539
Austevoll	8.22596E-05	0.239166
Fitjar	8.21579E-05	0.236884
Samnanger	8.19334E-05	0.231849
Fusa	8.10425E-05	0.211859
Osterøy	8.08361E-05	0.20723
Radøy	8.08107E-05	0.206659
Tysvær	8.07445E-05	0.205174
Sveio	8.07425E-05	0.20513
Vaksdal	8.00904E-05	0.190499
Utsira	7.95022E-05	0.177302

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Hemsedal	7.94924E-05	0.177083
Haugesund	7.93614E-05	0.174143
Vang	7.88102E-05	0.161778
Kvam	7.79263E-05	0.141946
Øygarden	7.7751E-05	0.138014
Evje og Hornnes	7.74141E-05	0.130456
Iveland	7.69948E-05	0.121047
Bømlo	7.69494E-05	0.120028
Bokn	7.66638E-05	0.113621
Mandal	7.65335E-05	0.110699
Jondal	7.6501E-05	0.109969
Austrheim	7.59099E-05	0.096707
Karmøy	7.49821E-05	0.075892
Marnardal	7.47685E-05	0.0711
Valle	7.4666E-05	0.0688
Lindesnes	7.45645E-05	0.066522
Sel	7.36646E-05	0.046332
Kvinnherad	7.3378E-05	0.039903
Voss	7.33633E-05	0.039572
Fedje	7.30636E-05	0.03285
Rennesøy	7.30169E-05	0.031802
Modalen	7.26474E-05	0.023512
Stavanger	7.21657E-05	0.012704
Randaberg	7.20034E-05	0.009062
Vindafjord	7.16251E-05	0.000575
Ølen	7.16251E-05	0.000575
Bygland	7.10778E-05	-0.011704
Kvitsøy	7.08921E-05	-0.01587
Granvin	7.06894E-05	-0.020418
Trondheim	7.03604E-05	-0.027798
Etne	7.02984E-05	-0.02919
Lyngdal	7.01889E-05	-0.031647
Sandnes	7.00961E-05	-0.033729
Hol	6.96588E-05	-0.043539
Audnedal	6.96048E-05	-0.04475
Bykle	6.93694E-05	-0.050033
Sola	6.90301E-05	-0.057645
Gjesdal	6.78381E-05	-0.084387
Rendalen	6.76553E-05	-0.08849
Melhus	6.73006E-05	-0.096447
Masfjorden	6.72991E-05	-0.09648
Klepp	6.71537E-05	-0.099742

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Odda	6.68313E-05	-0.106976
Stjørdal	6.68227E-05	-0.107169
Ulvik	6.68203E-05	-0.107223
Finnøy	6.68068E-05	-0.107525
Åseral	6.63275E-05	-0.11828
Malvik	6.61836E-05	-0.121508
Skaun	6.58505E-05	-0.128981
Time	6.56385E-05	-0.133736
Kvinesdal	6.55114E-05	-0.136587
Vågå	6.54852E-05	-0.137176
Klæbu	6.51932E-05	-0.143726
Suldal	6.5049E-05	-0.146962
Dovre	6.48844E-05	-0.150655
Hægebostad	6.44557E-05	-0.160273
Folldal	6.44052E-05	-0.161407
Engerdal	6.4053E-05	-0.169309
Ullensvang	6.38338E-05	-0.174227
Orkdal	6.38279E-05	-0.174358
Gulen	6.33756E-05	-0.184507
Eidfjord	6.28883E-05	-0.195439
Alvdal	6.23223E-05	-0.208137
Bjerkreim	6.21994E-05	-0.210894
Farsund	6.21577E-05	-0.21183
Midtre Gauldal	6.18072E-05	-0.219695
Sauda	6.16662E-05	-0.222858
Levanger	6.1336E-05	-0.230267
Forsand	6.12359E-05	-0.232512
Hå	6.11327E-05	-0.234826
Snillfjord	6.06455E-05	-0.245757
Flekkefjord	6.04987E-05	-0.249051
Verdal	5.96543E-05	-0.267997
Frosta	5.95345E-05	-0.270683
Hjelmeland	5.91827E-05	-0.278575
Sirdal	5.91299E-05	-0.27976
Strand	5.87726E-05	-0.287777
Lesja	5.86615E-05	-0.290269
Selbu	5.76964E-05	-0.311922
Eigersund	5.75045E-05	-0.316228
Vik	5.74308E-05	-0.317881
Lom	5.74024E-05	-0.318517
Meldal	5.73372E-05	-0.31998
Tynset	5.69172E-05	-0.329404

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Inderøy	5.66732E-05	-0.334879
Agdenes	5.60861E-05	-0.348049
Rissa	5.5764E-05	-0.355277
Rennebu	5.56201E-05	-0.358505
Hyllestad	5.52539E-05	-0.36672
Aurland	5.49303E-05	-0.373982
Skjåk	5.47186E-05	-0.378731
Leksvik	5.42096E-05	-0.390149
Steinkjer	5.41463E-05	-0.391571
Rindal	5.39402E-05	-0.396194
Meråker	5.39258E-05	-0.396517
Gaular	5.29549E-05	-0.4183
Mosvik	5.27606E-05	-0.422659
Oppdal	5.24188E-05	-0.430329
Hemne	5.16915E-05	-0.446646
Tolga	5.16756E-05	-0.447001
Lund	5.1626E-05	-0.448116
Sokndal	5.15256E-05	-0.450367
Høyanger	5.12155E-05	-0.457325
Fjaler	5.01136E-05	-0.482047
Tydal	4.96162E-05	-0.493206
Verran	4.95148E-05	-0.49548
Førde	4.9508E-05	-0.495633
Ørland	4.93721E-05	-0.498682
Balestrand	4.92956E-05	-0.500398
Leikanger	4.9156E-05	-0.503531
Surnadal	4.91486E-05	-0.503697
Bjugn	4.84697E-05	-0.518929
Halsa	4.83943E-05	-0.520619
Namdalseid	4.81969E-05	-0.525048
Åfjord	4.81487E-05	-0.52613
Holtålen	4.74474E-05	-0.541865
Os	4.73785E-05	-0.54341
Lærdal	4.69986E-05	-0.551933
Naustdal	4.58643E-05	-0.577382
Askvoll	4.52666E-05	-0.590792
Sogndal	4.51258E-05	-0.593951
Sunndal	4.39377E-05	-0.620607
Snåsa	4.33326E-05	-0.634183
Hitra	4.30848E-05	-0.639741
Smøla	4.30522E-05	-0.640472
Roan	4.30171E-05	-0.64126

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Tingvoll	4.29322E-05	-0.643165
Røros	4.21403E-05	-0.660932
Gjemnes	4.2095E-05	-0.661948
Namsos	4.18223E-05	-0.668067
Osen	4.16341E-05	-0.672288
Jølster	4.13146E-05	-0.679457
Årdal	4.12457E-05	-0.681003
Tromsø	4.0988E-05	-0.686785
Bodø	4.08127E-05	-0.690718
Solund	4.04747E-05	-0.698301
Luster	4.00741E-05	-0.707289
Flora	3.97811E-05	-0.71386
Grong	3.95647E-05	-0.718716
Frøya	3.94401E-05	-0.721512
Kristiansund	3.90987E-05	-0.729171
Frei	3.90987E-05	-0.729171
Molde	3.90401E-05	-0.730486
Eide	3.87889E-05	-0.736121
Fauske	3.84481E-05	-0.743767
Overhalla	3.83932E-05	-0.745
Flatanger	3.8317E-05	-0.74671
Fosnes	3.80074E-05	-0.753656
Bremanger	3.75038E-05	-0.764955
Aure	3.74334E-05	-0.766534
Tustna	3.74334E-05	-0.766534
Nesset	3.71978E-05	-0.77182
Fræna	3.69812E-05	-0.776678
Sørfold	3.68736E-05	-0.779093
Averøy	3.6707E-05	-0.78283
Høylandet	3.64859E-05	-0.787791
Gloppen	3.60857E-05	-0.796771
Saltdal	3.60331E-05	-0.797951
Vestnes	3.54142E-05	-0.811836
Midsund	3.50589E-05	-0.819807
Balsfjord	3.49345E-05	-0.822598
Aukra	3.40582E-05	-0.842258
Målselv	3.39883E-05	-0.843826
Lavangen	3.39833E-05	-0.843939
Narvik	3.38286E-05	-0.847408
Storfjord	3.36793E-05	-0.850758
Bardu	3.35513E-05	-0.853631
Rauma	3.28225E-05	-0.869982

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Skodje	3.27901E-05	-0.870709
Haram	3.26186E-05	-0.874557
Ørskog	3.25921E-05	-0.87515
Eid	3.25014E-05	-0.877186
Tysfjord	3.24968E-05	-0.877289
Gratangen	3.2492E-05	-0.877396
Lyngen	3.21832E-05	-0.884325
Karlsøy	3.20499E-05	-0.887315
Ballangen	3.18645E-05	-0.891475
Evenes	3.17958E-05	-0.893016
Ibestad	3.17077E-05	-0.894993
Stordal	3.14746E-05	-0.900223
Ålesund	3.14344E-05	-0.901123
Tjeldsund	3.13038E-05	-0.904054
Lødingen	3.12671E-05	-0.904878
Beiarn	3.1232E-05	-0.905666
Stryn	3.08907E-05	-0.913323
Lierne	3.0788E-05	-0.915626
Sørreisa	3.07482E-05	-0.91652
Giske	3.04165E-05	-0.923962
Hamarøy	3.01667E-05	-0.929566
Sula	3.01564E-05	-0.929797
Skånland	3.01527E-05	-0.929881
Namsskogan	2.9965E-05	-0.934092
Nærøy	2.98278E-05	-0.937168
Gildeskål	2.9785E-05	-0.93813
Lenvik	2.97435E-05	-0.939061
Harstad	2.96702E-05	-0.940705
Sykkylven	2.96237E-05	-0.941749
Tranøy	2.96156E-05	-0.941929
Salangen	2.92785E-05	-0.949493
Dyrøy	2.91614E-05	-0.95212
Norddal	2.89317E-05	-0.957275
Gáivuotna Kåfjord	2.85417E-05	-0.966024
Sandøy	2.83299E-05	-0.970776
Hornindal	2.82487E-05	-0.972597
Stranda	2.78441E-05	-0.981673
Sortland	2.76868E-05	-0.985205
Røyrvik	2.76673E-05	-0.985641
Kvæfjord	2.76433E-05	-0.98618
Steigen	2.74344E-05	-0.990867
Vågsøy	2.70241E-05	-1.000071

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Meløy	2.69805E-05	-1.00105
Vikna	2.68716E-05	-1.003493
Hareid	2.61973E-05	-1.01862
Ulstein	2.57349E-05	-1.028995
Selje	2.56926E-05	-1.029944
Ørsta	2.51055E-05	-1.043116
Bjarkøy	2.48163E-05	-1.049604
Hadsel	2.46749E-05	-1.052778
Nordreisa	2.46111E-05	-1.054208
Øksnes	2.45468E-05	-1.055651
Volda	2.43552E-05	-1.05995
Leka	2.42979E-05	-1.061235
Berg	2.3677E-05	-1.075165
Torsken	2.36606E-05	-1.075534
Herøy	2.29864E-05	-1.090659
Bø	2.28561E-05	-1.093583
Sande	2.25242E-05	-1.10103
Rana	2.22495E-05	-1.107193
Skjervøy	2.19439E-05	-1.114048
Moskenes	2.09032E-05	-1.137396
Kvænangen	2.08338E-05	-1.138954
Rødøy	2.05124E-05	-1.146165
Vågan	2.04912E-05	-1.14664
Vanylven	2.03386E-05	-1.150065
Vestvågøy	2.0018E-05	-1.157257
Flakstad	1.99929E-05	-1.157819
Hemnes	1.93911E-05	-1.171321
Alta	1.87946E-05	-1.184706
Andøy	1.82904E-05	-1.196017
Lurøy	1.71482E-05	-1.221643
Loppa	1.69256E-05	-1.226638
Nesna	1.68615E-05	-1.228075
Vefsn	1.65403E-05	-1.23528
Leirfjord	1.54878E-05	-1.258894
Værøy	1.48524E-05	-1.273149
Alstahaug	1.48155E-05	-1.273978
Kvalsund	1.30692E-05	-1.313158
Dønna	1.2352E-05	-1.329249
Hattfjelldal	1.21937E-05	-1.3328
Vevelstad	1.2117E-05	-1.33452
Guovdageaidnu Kautokeino	1.20906E-05	-1.335114
Porsanger Porsángu Porsanki	1.20579E-05	-1.335847

Municipality	Contracted physician man-labor years per resident adjusted *time*	Standardized Index
Herøy	1.19354E-05	-1.338595
Hammerfest	1.15336E-05	-1.34761
Kárásjohka Karasjok	1.14705E-05	-1.349024
Grane	1.14248E-05	-1.35005
Træna	1.11027E-05	-1.357277
Hasvik	1.0033E-05	-1.381277
Røst	9.82298E-06	-1.385988
Brønnøy	9.75365E-06	-1.387544
Måsøy	9.54604E-06	-1.392201
Vega	9.33962E-06	-1.396832
Sømna	9.26045E-06	-1.398609
Nordkapp	9.05725E-06	-1.403168
Bindal	6.7043E-06	-1.455957
Deatnu Tana	5.48308E-06	-1.483356
Unjárga Nesseby	4.91777E-06	-1.496039
Gamvik	4.75232E-06	-1.499751
Lebesby	4.62334E-06	-1.502645
Vadsø	4.10341E-06	-1.51431
Båtsfjord	3.62737E-06	-1.52499
Berlevåg	3.20654E-06	-1.534431
Sør-Varanger	3.18516E-06	-1.534911
Vardø	3.0399E-06	-1.53817

Appendix J: Accessibility indices for contracted physician man labor years adjusted for distance in km

The table below shows the *Contracted physician man labor years per resident adjusted for distance in km* and the *standardized index* for all of the 430 municipalities in Norway

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Oslo	7.53394E-05	13.1689386936951000
Bergen	4.69189E-05	8.1076989701276300
Trondheim	4.69058E-05	8.1053601364203000
Tromsø	3.06398E-05	5.2086381806366500
Bodø	2.90215E-05	4.9204475375890400
Stavanger	2.00577E-05	3.3241423231654800
Bærum	1.87778E-05	3.0962080606004800
Os	1.46576E-05	2.3624677367636300
Haugesund	1.27399E-05	2.0209552881930700
Levanger	1.12573E-05	1.7569205875611600
Utsira	1.00216E-05	1.5368653437147000
Ålesund	9.75581E-06	1.4895329404014000
Fjell	9.43733E-06	1.4328174362581700
Sandnes	9.26575E-06	1.4022626538240200
Asker	8.79914E-06	1.3191655965235300
Skedsmo	8.79186E-06	1.3178686361946500
Kristiansand	8.66626E-06	1.2955014863066000
Fredrikstad	7.97129E-06	1.1717392548824900
Alta	6.90474E-06	0.9818023757824680
Narvik	6.14953E-06	0.8473121456283860
Tønsberg	6.08493E-06	0.8358080679872540
Rælingen	6.00286E-06	0.8211929269942980
Drammen	5.84846E-06	0.7936967906164260
Lørenskog	5.43523E-06	0.7201069946931490
Hamar	5.16421E-06	0.6718419831155460
Kvitsøy	4.61329E-06	0.5737322299776400
Sarpsborg	4.55329E-06	0.5630470748044890
Namsos	4.50268E-06	0.5540338718544880
Randaberg	4.47617E-06	0.5493135373029280

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Askøy	3.95691E-06	0.4568401119013780
Stord	3.91644E-06	0.4496330428710600
Oppegård	3.81397E-06	0.4313856674794210
Moss	3.72826E-06	0.4161227327271200
Skien	3.5617E-06	0.3864605154905420
Sandefjord	3.45885E-06	0.3681447401703410
Øksnes	3.45318E-06	0.3671353125751690
Rana	3.39842E-06	0.3573834521366530
Lillehammer	3.32813E-06	0.3448649569853590
Froland	3.31089E-06	0.3417945586317410
Molde	3.30197E-06	0.3402057146815130
Kristiansund	3.30197E-06	0.3402055377759680
Frei	3.30197E-06	0.3402055377759680
Voss	3.21007E-06	0.3238410774583970
Porsgrunn	3.05746E-06	0.2966626315626190
Sola	2.98665E-06	0.2840529634230320
Gjøvik	2.77796E-06	0.2468886596398620
Kongsberg	2.66008E-06	0.2258956453943180
Ski	2.61526E-06	0.2179138211311040
Kárásjohka Karasjok	2.58928E-06	0.2132868476350010
Larvik	2.46835E-06	0.1917508911261120
Elverum	2.42429E-06	0.1839061135240060
Eigersund	2.20697E-06	0.1452042443599900
Sortland	2.16001E-06	0.1368409595968570
Kvæfjord	2.15774E-06	0.1364376497932200
Porsanger Porsángu Porsanki	2.15773E-06	0.1364353020937660
Steinkjer	2.1035E-06	0.1267770792626590
Oppdal	2.10125E-06	0.1263770818043030
Nesodden	2.0405E-06	0.1155588184240340
Flora	2.00631E-06	0.1094696793158730
Frogn	1.90831E-06	0.0920182964925823
Røros	1.90613E-06	0.0916299374975283
Horten	1.90452E-06	0.0913425064561785
Stjørdal	1.87394E-06	0.0858972449010656
Nøtterøy	1.87171E-06	0.0855000219464077
Ullensaker	1.72775E-06	0.0598629241890210

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Fauske	1.72644E-06	0.0596291700021866
Rygge	1.69809E-06	0.0545798813830699
Sømna	1.6183E-06	0.0403707647059974
Songdalen	1.61053E-06	0.0389871697838686
Halden	1.58902E-06	0.0351575354818023
Rindal	1.50089E-06	0.0194628834472956
Time	1.49065E-06	0.0176395355824830
Hobøl	1.47705E-06	0.0152168912349616
Fet	1.46608E-06	0.0132636876130296
Ringsaker	1.35186E-06	-0.0070766884841538
Nittedal	1.34412E-06	-0.0084564373286214
Giske	1.3203E-06	-0.0126970762894238
Klepp	1.30664E-06	-0.0151303150852308
Førde	1.30242E-06	-0.0158820429084015
Lardal	1.26633E-06	-0.0223097863612390
Kvinnherad	1.20506E-06	-0.0332208234147888
Naustdal	1.12148E-06	-0.0481040593957278
Nannestad	1.1116E-06	-0.0498635091387514
Lier	1.02525E-06	-0.0652408435730140
Eidfjord	1.00322E-06	-0.0691642510557950
Etne	1.0032E-06	-0.0691685583477224
Odda	1.00314E-06	-0.0691788647798121
Sauda	1.00314E-06	-0.0691789897553264
Ringerike	9.82234E-07	-0.0729021217765789
Notodden	9.77419E-07	-0.0737596723696529
Vestby	9.60414E-07	-0.0767878697019032
Melhus	9.12771E-07	-0.0852724468418034
Verdal	8.56404E-07	-0.0953104233805354
Kongsvinger	8.52517E-07	-0.0960027633588583
Lærdal	8.42637E-07	-0.0977621027820810
Råde	7.54301E-07	-0.1134934744916500
Tynset	7.47813E-07	-0.1146488274279120
Søgne	7.27881E-07	-0.1181983788555830
Gjesdal	7.0055E-07	-0.1230655908341070
Vefsn	6.90474E-07	-0.1248599953413480
Tysvær	6.73642E-07	-0.1278574995864810

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Ås	6.73095E-07	-0.1279548666534400
Sund	6.68653E-07	-0.1287460832059480
Averøy	6.66656E-07	-0.1291016218640570
Gjerdrum	6.45298E-07	-0.1329051651837750
Arendal	5.51444E-07	-0.1496191018491030
Holmestrand	5.35394E-07	-0.1524773100417960
Risør	5.24116E-07	-0.1544857832174330
Stokke	5.09297E-07	-0.1571248649538200
Strand	5.03074E-07	-0.1582330637748160
Kvam	5.01618E-07	-0.1584923626382870
Jevnaker	4.83656E-07	-0.1616911344975620
Nedre Eiker	4.64414E-07	-0.1651177764017280
Rissa	4.60815E-07	-0.1657585946139960
Sveio	4.52358E-07	-0.1672647945548500
Malvik	4.40537E-07	-0.1693697916444630
Hadsel	4.36389E-07	-0.1701085598292610
Klæbu	4.35294E-07	-0.1703035318696080
Bjarkøy	4.31591E-07	-0.1709630284950830
Alstahaug	4.31547E-07	-0.1709708892761390
Vestvågøy	4.31546E-07	-0.1709710218497490
Vestnes	4.20857E-07	-0.1728746208410110
Røyken	4.08537E-07	-0.1750686273942160
Øvre Eiker	3.98592E-07	-0.1768395884488220
Lunner	3.97371E-07	-0.1770571048377930
Mandal	3.77447E-07	-0.1806052088777410
Modum	3.76666E-07	-0.1807442100955270
Hjartdal	3.76469E-07	-0.1807793401954610
Farsund	3.7391E-07	-0.1812350997521330
Flekkefjord	3.73908E-07	-0.1812355051491640
Vennesla	3.70727E-07	-0.1818018505230070
Stange	3.64516E-07	-0.1829080468267130
Askim	3.39376E-07	-0.1873850820866780
Løten	3.09492E-07	-0.1927069996327140
Midtre Gauldal	3.02031E-07	-0.1940355373379230
Volda	3.00185E-07	-0.1943644251404040
Seljord	2.99267E-07	-0.1945278531704170

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Nes	2.99125E-07	-0.1945530823382730
Gran	2.98414E-07	-0.1946797671704930
Våler	2.94543E-07	-0.1953690909886020
Vestre Toten	2.92359E-07	-0.1957581201581870
Karmøy	2.90759E-07	-0.1960428919796010
Tysnes	2.90734E-07	-0.1960474730634010
Sørum	2.81681E-07	-0.1976597110701480
Andebu	2.75385E-07	-0.1987809284776310
Re	2.5818E-07	-0.2018447580815170
Meland	2.53947E-07	-0.2025985763556930
Grimstad	2.43353E-07	-0.2044852902360320
Rennesøy	2.41922E-07	-0.2047401188774210
Østre Toten	2.3715E-07	-0.2055899611096890
Spydeberg	2.1714E-07	-0.2091532902735000
Bømlo	2.12737E-07	-0.2099375270425640
Fjaler	2.0097E-07	-0.2120330597982550
Tvedestrand	1.9539E-07	-0.2130267181892170
Siljan	1.83747E-07	-0.2151001211704910
Lindås	1.7692E-07	-0.2163158868177310
Fitjar	1.71844E-07	-0.2172198170303530
Tokke	1.49575E-07	-0.2211856444587250
Sør-Fron	1.49564E-07	-0.2211876034861200
Hole	1.43942E-07	-0.2221888205611010
Enebakk	1.34911E-07	-0.2237970462553560
Bamble	1.23501E-07	-0.2258290151900230
Sula	1.22197E-07	-0.2260612463413580
Skaun	1.18648E-07	-0.2266931972382310
Sande	1.12131E-07	-0.2278537486479220
Tjøme	8.85163E-08	-0.2320592330691720
Åmot	7.62386E-08	-0.2342456886112680
Kragerø	7.49616E-08	-0.2344731079170460
Tinn	7.47867E-08	-0.2345042437397880
Sørfold	6.76103E-08	-0.2357822568638950
Øyer	6.60427E-08	-0.2360614119288530
Harstad	6.57801E-08	-0.2361081779823290
Aukra	6.42173E-08	-0.2363864874808170

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Osterøy	6.13805E-08	-0.2368916893761420
Inderøy	5.71627E-08	-0.2376428038943650
Skiptvet	5.58931E-08	-0.2378689005006440
Svelvik	5.27202E-08	-0.2384339443040850
Hurum	4.81497E-08	-0.2392478815884120
Austevoll	4.59127E-08	-0.2396462634758220
Ørsta	4.49383E-08	-0.2398197824168660
Fræna	4.39193E-08	-0.2400012524013720
Forsand	4.01987E-08	-0.2406638210111050
Lindesnes	3.64386E-08	-0.2413334472028070
Hof	3.25371E-08	-0.2420282404095000
Lillesand	3.0791E-08	-0.2423391869327330
Sykkylven	3.01387E-08	-0.2424553506032400
Nes	2.99075E-08	-0.2424965341084210
Hå	2.99069E-08	-0.2424966302032670
Overhalla	2.91492E-08	-0.2426315682559390
Eidsberg	2.75723E-08	-0.2429123932575520
Hvaler	2.71793E-08	-0.2429823744644510
Granvin	2.6477E-08	-0.2431074511914440
Gaular	2.54907E-08	-0.2432830999070620
Rakkestad	2.2414E-08	-0.2438310100260470
Bjerkreim	2.15919E-08	-0.2439774106929450
Flesberg	2.14502E-08	-0.2440026422015940
Trøgstad	1.92021E-08	-0.2444029966357390
Dønna	1.72425E-08	-0.2447519720665370
Gausdal	1.53381E-08	-0.2450911139694960
Fusa	1.40995E-08	-0.2453116918629650
Herøy	1.38374E-08	-0.2453583607368460
Finnøy	1.37609E-08	-0.2453719922497340
Kviteseid	1.35115E-08	-0.2454164063965350
Birkenes	1.34219E-08	-0.2454323561851900
Ulvik	1.32284E-08	-0.2454668132145640
Skodje	1.20385E-08	-0.2456787145004800
Sokndal	1.14659E-08	-0.2457806953596000
Verran	1.13904E-08	-0.2457941321344430
Orkdal	9.00509E-09	-0.2462189198436940

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Sør-Odal	8.78299E-09	-0.2462584737656080
Leirfjord	8.76878E-09	-0.2462610029699400
Saltdal	8.61806E-09	-0.2462878438588960
Sauherad	8.43306E-09	-0.2463207907721120
Aurskog-Høland	8.17039E-09	-0.2463675669550360
Smøla	7.86386E-09	-0.2464221565968900
Jondal	7.58186E-09	-0.2464723762338500
Tolga	7.36805E-09	-0.2465104517493940
Nord-Fron	7.299E-09	-0.2465227490719630
Fosnes	6.90626E-09	-0.2465926895178180
Eidsvoll	6.81778E-09	-0.2466084454879780
Alvdal	6.27864E-09	-0.2467044588932660
Ringebu	6.25475E-09	-0.2467087124685820
Nome	6.05187E-09	-0.2467448419523990
Vindafjord	5.39291E-09	-0.2468621928741900
Ølen	5.39291E-09	-0.2468621928741900
Øygarden	5.29786E-09	-0.2468791194804670
Søndre Land	4.94298E-09	-0.2469423186501250
Ørskog	4.53751E-09	-0.2470145264106300
Askvoll	4.49723E-09	-0.2470216997963700
Kvinesdal	4.28842E-09	-0.2470588847089560
Bokn	4.12738E-09	-0.2470875636897250
Midsund	4.09031E-09	-0.2470941664262410
Mosvik	4.04564E-09	-0.2471021209135570
Radøy	3.95316E-09	-0.2471185899791620
Marnardal	3.86559E-09	-0.2471341846265670
Vegårshei	3.83795E-09	-0.2471391066429720
Samnanger	3.68781E-09	-0.2471658439965810
Suldal	3.65592E-09	-0.2471715233192420
Namdalseid	3.61456E-09	-0.2471788893420240
Hurdal	3.61078E-09	-0.2471795629103220
Frosta	3.14511E-09	-0.2472624910713310
Hareid	2.75748E-09	-0.2473315222869420
Gjemnes	2.67832E-09	-0.2473456194995220
Lyngdal	2.53257E-09	-0.2473715747498240
Eide	2.08027E-09	-0.2474521221269600

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Vaksdal	1.95424E-09	-0.2474745654705020
Meldal	1.8945E-09	-0.2474852049743650
Våler	1.84885E-09	-0.2474933343304580
Flakstad	1.83784E-09	-0.2474952954926800
Bø	1.79715E-09	-0.2475025415101740
Ullensvang	1.68405E-09	-0.2475226825310850
Eidskog	1.59806E-09	-0.2475379961560570
Iveland	1.59194E-09	-0.2475390867061560
Moskenes	1.55142E-09	-0.2475463020706310
Surnadal	1.54318E-09	-0.2475477700894960
Holtålen	1.31378E-09	-0.2475886220373900
Ulstein	1.24891E-09	-0.2476001745620600
Vinje	1.16195E-09	-0.2476156600146390
Aremark	1.10255E-09	-0.2476262393635320
Hemnes	9.7168E-10	-0.2476495446978590
Sogndal	9.19926E-10	-0.2476587613043530
Haram	8.77182E-10	-0.2476663732478430
Gjerstad	8.04478E-10	-0.2476793207902750
Grue	6.92265E-10	-0.2476993041904330
Selbu	6.67397E-10	-0.2477037326381030
Audnedal	6.49097E-10	-0.2477069915993680
Brønnøy	6.12113E-10	-0.2477135779994690
Sandøy	5.84371E-10	-0.2477185182717080
Ballangen	4.98641E-10	-0.2477337854536150
Leksvik	4.88125E-10	-0.2477356581655070
Nordre Land	4.18706E-10	-0.2477480207207940
Årdal	3.89277E-10	-0.2477532614530910
Hjelmeland	3.6054E-10	-0.2477583791511200
Nesna	3.02994E-10	-0.2477686271415630
Nord-Odal	2.88665E-10	-0.2477711789968980
Aurland	2.83759E-10	-0.2477720526769550
Gol	2.72767E-10	-0.2477740101290950
Åmli	2.56868E-10	-0.2477768415631240
Værøy	2.50546E-10	-0.2477779673845520
Krødsherad	2.41134E-10	-0.2477796435225780
Marker	2.39917E-10	-0.2477798602359090

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Flå	2.3252E-10	-0.2477811775397180
Åsnes	2.09022E-10	-0.2477853621327910
Snillfjord	1.94821E-10	-0.2477878910717600
Karlsøy	1.84529E-10	-0.2477897238284330
Rennebu	1.72822E-10	-0.2477918088065710
Lund	1.58973E-10	-0.2477942751093100
Austrheim	1.57939E-10	-0.2477944591370220
Grong	1.57684E-10	-0.2477945046081810
Gratangen	1.56317E-10	-0.2477947479863830
Stordal	1.42081E-10	-0.2477972833149060
Høylandet	1.1219E-10	-0.2478026064306910
Sigdal	9.46725E-11	-0.2478057259383980
Jølster	8.92196E-11	-0.2478066970184350
Drangedal	8.87824E-11	-0.2478067748775650
Os	7.25959E-11	-0.2478096574421310
Hyllestad	6.88118E-11	-0.2478103313283980
Meråker	6.30635E-11	-0.2478113550205650
Aure	6.09487E-11	-0.2478117316159810
Tustna	6.09487E-11	-0.2478117316159810
Rauma	4.25225E-11	-0.2478150130343270
Evje og Hornnes	4.15653E-11	-0.2478151835061120
Vanylven	4.09815E-11	-0.2478152874633240
Bø	4.04575E-11	-0.2478153807886490
Evenes	4.04412E-11	-0.2478153836842950
Tingvoll	3.95849E-11	-0.2478155361847790
Nesset	3.77158E-11	-0.2478158690468980
Rømskog	3.71874E-11	-0.2478159631307810
Stranda	3.46349E-11	-0.2478164177020080
Lødingen	3.15906E-11	-0.2478169598400710
Fyresdal	2.99767E-11	-0.2478172472435660
Halsa	2.94606E-11	-0.2478173391637860
Fedje	2.27489E-11	-0.2478185344090790
Bremanger	2.16741E-11	-0.2478187258154660
Lavangen	1.91427E-11	-0.2478191766152040
Masfjorden	1.553E-11	-0.2478198199839500
Snåsa	1.45761E-11	-0.2478199898530870

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Nissedal	1.39291E-11	-0.2478201050672140
Leikanger	1.38156E-11	-0.2478201252839960
Rollag	1.36669E-11	-0.2478201517731630
Åfjord	1.3074E-11	-0.2478202573487470
Tjeldsund	1.25409E-11	-0.2478203522838130
Nærøy	1.24309E-11	-0.2478203718863550
Høyanger	1.16299E-11	-0.2478205145300580
Sel	1.07563E-11	-0.2478206701061190
Herøy	9.91733E-12	-0.2478208195092570
Sande	9.5912E-12	-0.2478208775880490
Agdenes	9.08652E-12	-0.2478209674632300
Hægebostad	8.08685E-12	-0.2478211454895230
Vevelstad	7.91554E-12	-0.2478211759966880
Vågan	7.80177E-12	-0.2478211962571280
Skånland	7.73737E-12	-0.2478212077249840
Vik	5.42339E-12	-0.2478216198096390
Rendalen	4.78226E-12	-0.2478217339852050
Modalen	4.58944E-12	-0.2478217683222610
Røst	4.32135E-12	-0.2478218160644240
Grane	4.15858E-12	-0.2478218450524210
Bindal	4.12425E-12	-0.2478218511647860
Luster	4.07264E-12	-0.2478218603556260
Vega	3.61774E-12	-0.2478219413666500
Bjugn	3.60139E-12	-0.2478219442780530
Valle	3.11297E-12	-0.2478220312586100
Lyngen	2.82303E-12	-0.2478220828931430
Ibestad	2.79632E-12	-0.2478220876488310
Nore og Uvdal	2.59623E-12	-0.2478221232814280
Sunndal	2.01957E-12	-0.2478222259767850
Etnedal	1.6188E-12	-0.2478222973466950
Ørland	1.50646E-12	-0.2478223173529260
Ål	1.44573E-12	-0.2478223281670140
Trysil	1.27709E-12	-0.2478223582006240
Folldal	1.20359E-12	-0.2478223712897050
Gulen	1.0964E-12	-0.2478223903778220
Gáivuotna Kåfjord	9.78054E-13	-0.2478224114536710

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Åseral	8.77287E-13	-0.2478224293985840
Tysfjord	8.12405E-13	-0.2478224409531880
Flatanger	7.44585E-13	-0.2478224530307330
Sør-Aurdal	6.42549E-13	-0.2478224712017940
Osen	5.91241E-13	-0.2478224803388770
Beiarn	3.53534E-13	-0.2478225226708480
Norddal	2.77917E-13	-0.2478225361370500
Tydal	2.7645E-13	-0.2478225363983430
Balsfjord	2.71935E-13	-0.2478225372022360
Sirdal	2.67547E-13	-0.2478225379837000
Hemsedal	2.58882E-13	-0.2478225395268070
Gildeskål	2.47694E-13	-0.2478225415192890
Vågsøy	2.26733E-13	-0.2478225452521570
Storfjord	1.55332E-13	-0.2478225579674760
Bygland	1.31576E-13	-0.2478225621980830
Stor-Elvdal	1.31486E-13	-0.2478225622140240
Bykle	1.21912E-13	-0.2478225639189940
Balestrand	1.21199E-13	-0.2478225640460180
Hattfjelldal	1.13623E-13	-0.2478225653951250
Gloppen	9.44201E-14	-0.2478225688149150
Lurøy	9.06149E-14	-0.2478225694925610
Salangen	8.49633E-14	-0.2478225704990240
Bardu	8.14219E-14	-0.2478225711296960
Vikna	7.13743E-14	-0.2478225729190090
Solund	6.02828E-14	-0.2478225748942380
Vågå	2.51095E-14	-0.2478225811580550
Hol	2.49375E-14	-0.2478225811886800
Hemne	2.20848E-14	-0.2478225816967110
Dovre	1.93611E-14	-0.2478225821817590
Roan	1.86108E-14	-0.2478225823153760
Nord-Aurdal	1.37962E-14	-0.2478225831727700
Kvænangen	1.14212E-14	-0.2478225835957180
Dyrøy	1.07676E-14	-0.2478225837121220
Eid	2.85736E-15	-0.2478225851208080
Tranøy	2.70152E-15	-0.2478225851485600
Kvalsund	1.38431E-15	-0.2478225853831350

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Andøy	1.07615E-15	-0.2478225854380130
Meløy	8.62553E-16	-0.2478225854760510
Hamarøy	8.55594E-16	-0.2478225854772900
Leka	5.99259E-16	-0.2478225855229390
Hitra	5.66241E-16	-0.2478225855288190
Vestre Slidre	2.61956E-16	-0.2478225855830080
Namsskogan	2.03567E-16	-0.2478225855934060
Målselv	1.98354E-16	-0.2478225855943340
Øystre Slidre	1.42687E-16	-0.2478225856042480
Loppa	1.01822E-16	-0.2478225856115250
Sørreisa	8.3319E-17	-0.2478225856148200
Nordreisa	6.36461E-17	-0.2478225856183240
Lesja	3.64325E-17	-0.2478225856231700
Træna	3.35935E-17	-0.2478225856236760
Lierne	3.33464E-17	-0.2478225856237200
Stryn	2.87387E-17	-0.2478225856245400
Lom	2.43129E-17	-0.2478225856253280
Frøya	1.6504E-17	-0.2478225856267190
Guovdageaidnu Kautokeino	1.26273E-17	-0.2478225856274090
Engerdal	1.08205E-17	-0.2478225856277310
Røyrvik	3.58408E-18	-0.2478225856290200
Lenvik	2.9859E-18	-0.2478225856291260
Vang	2.40001E-18	-0.2478225856292310
Skjåk	2.38931E-18	-0.2478225856292330
Hammerfest	2.11742E-18	-0.2478225856292810
Hornindal	1.65147E-18	-0.2478225856293640
Rødøy	1.0565E-18	-0.2478225856294700
Selje	9.29051E-19	-0.2478225856294930
Skjervøy	6.02493E-19	-0.2478225856295510
Måsøy	9.63516E-20	-0.2478225856296410
Hasvik	6.47792E-20	-0.2478225856296460
Steigen	1.49453E-20	-0.2478225856296550
Nordkapp	7.30095E-21	-0.2478225856296570
Torsken	1.76725E-21	-0.2478225856296580
Berg	1.08528E-21	-0.2478225856296580
Deatnu Tana	7.08888E-23	-0.2478225856296580

Municipality	Contracted physician man-labor years per resident adjusted *km*	Standardized Index
Unjárga Nesseby	1.67099E-25	-0.2478225856296580
Gamvik	1.71731E-26	-0.2478225856296580
Lebesby	1.49296E-26	-0.2478225856296580
Vadsø	3.37476E-29	-0.2478225856296580
Båtsfjord	5.49573E-32	-0.2478225856296580
Berlevåg	1.18455E-34	-0.2478225856296580
Sør-Varanger	4.53455E-35	-0.2478225856296580
Vardø	8.45214E-36	-0.2478225856296580